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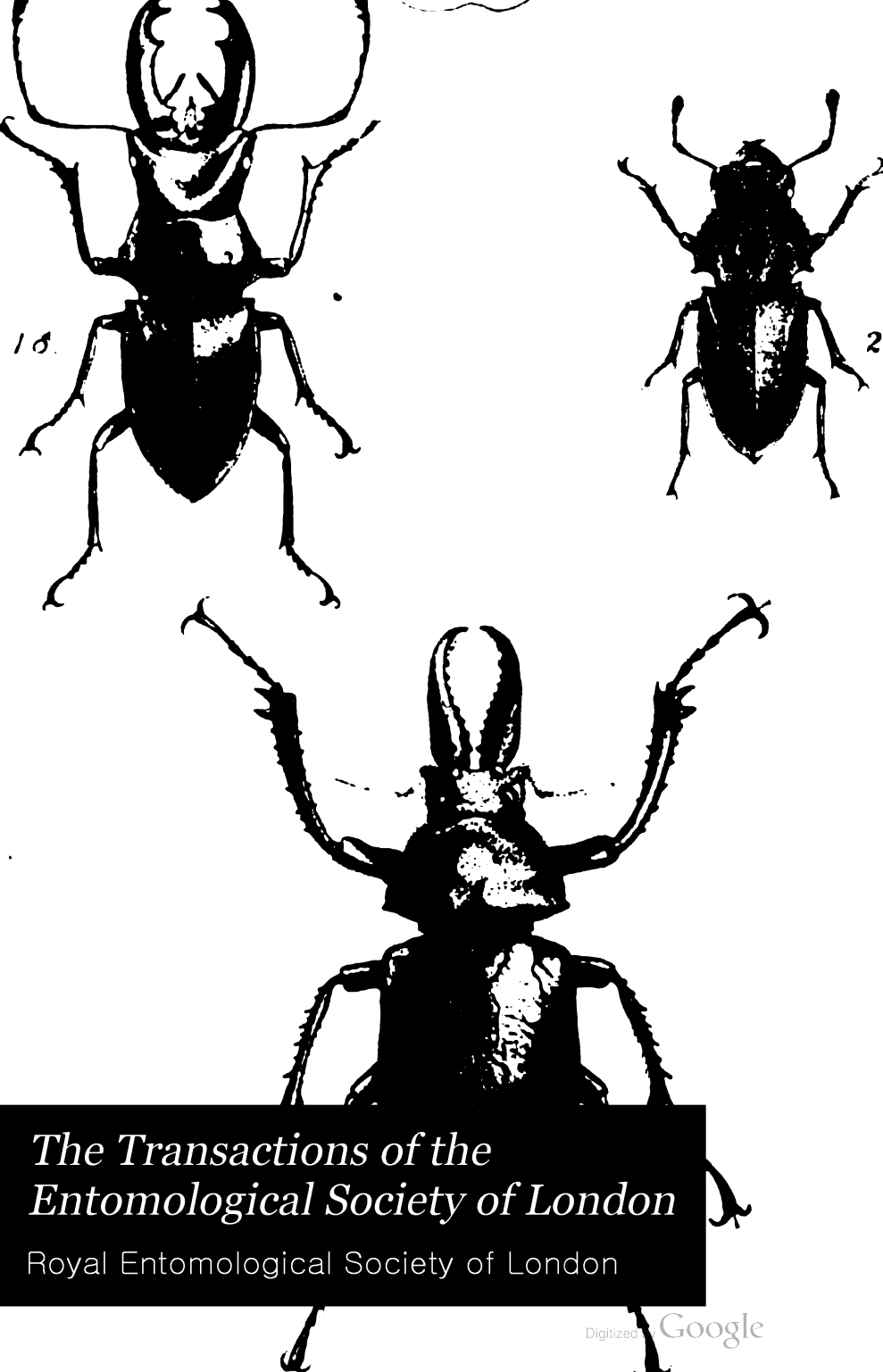

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1866		Ward, Christopher, F.L.S., Halifax.
1850		Waring, S. L., The Oaks, Norwood, S.E.
1869		Waterhouse, C. O., British Museum, W.C.
*		Waterhouse, G. R., F.Z.S., &c., British Museum, W.C.
1869		Webedale, C. G., 78, High Street, Barnstaple.
1845		Weir, J. Jenner, F.L.S., 6, Haddo Villas, Blackheath, S.E.
1855		Were, R. B., 35, Osborne Terrace, Clapham Road, S.W.

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Date of Election.		
*		Westwood, Professor J. O., M.A., F.L.S., &c., *President*, Oxford.
1868	†	White, F. Buchanan, M.D., Eastferry, by Dunkeld, N.B.
1865		White, Rev. W. Farren, Stonehouse Vicarage, Gloucestershire.
1849		Wilkinson, S. J., 16, Austin Friars, E.C.
1863		Wix, William, Isbells, Reigate.
1843		Wollaston, T. Vernon, M.A., F.L.S., 1, Barnepark Terrace, Teignmouth, Devon.
1862		Wormald, Percy C., 2, Clifton Villas, Highgate Hill, N.
1866		Wright, Professor E. Perceval, M.A., M.D., F.L.S., &c., Trinity College, Dublin.
1865	S.	Young, Morris, Free Museum, Paisley.

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THE

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON

FOR THE YEAR 1872.

I. Stylopidarum, *ordinem* Strepsipterorum Kirbii *constituentium, mihi tamen potius* Coleopterorum *Familiæ,* Rhipiphoridis Meloïdisque *propinquæ, Monographia.* Auctore S. S. Saunders.

[Read July 3rd, 1871.]

Familia STYLOPIDÆ.

Synonyma.

Ordo *Strepsiptera,* Kirb. (*a*).
Sect. *Diptères Rhipidoptères,* Lamarck (*b*).
Ordo *Rhipiptera,* Latr. (*c*).
Fam. *Stylopidæ,* Kirb. (*d*).

(*a*) Kirby, Trans. Linn. Soc. Lond., Tom. XI. p. 107, 1813; Westwood, Trans. Ent. Soc. vol. i.-ii., 1834-40; Introd. Mod. Classif. Ins. Tom. II. p. 287, 1840; Siebold, Wiegm. Archiv. 1843, p. 137; Newport, Trans. Linn. Soc. Lond., Tom. XX. p. 330, 1847.

(*b*) Lamarck, Hist. Nat. Anim. s. Vertebr. ed. i. Tom. III. p. 348, 1816; ed. 2, Tom. IV. p. 18, 1818.

(*c*) Latreille, Reg. Anim. ed. i. Tom. III. p. 584, 1817.

(*d*) Kirby, Trans. Linn. Soc. Lond., *loc. cit.*, pp. 100, 102, 104; Stephens, Syst. Catal. Brit. Ins. Pars. I. p. 403, 1829; Westwood, *op. cit.*, Gen. Syn. p. 86; Schaum, Catal. Coleopt. Eur. Ed. 2a, Berolini, 1862; Crotch, Catal. of Brit. Coleopt. Cantabrigiæ, 1863; Packard, "Guide to the study of Insects," Americæ, 1870; Sharp, Catal. of Brit. Coleopt. Londini, 1871.

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Fam. *Stylopites*, Newm. (*e*).
Fam. *Stylopides*, Lacord. (*f*).

The vexed question of the affinities of the *Stylopidæ*, can no longer be considered so difficult of solution as formerly. Kirby's first impression was, that his newly-discovered *Stylops* "from its elytra (which, however, are placed in a very extraordinary situation, being fixed to the sides of the thorax), ought to be a *Coleopterous* insect, "although it seemed" to possess but little of the general habit and character of that class" (*g*). Subsequently, from an error of his draughtsman, in whom he placed the utmost confidence (*h*), he describes these organs as "apparently attached to the coxæ of the anterior pair of legs" (*i*); and again—"Elytra coxis pedum anticorum, ut videtur, affixa" (*k*). Hence, while adverting to this as "a circumstance most singular and without parallel in the entomological world," he was not unnaturally led to consider these insects as utterly irreconcilable with any of the existing Orders; more especially when unable to solve the difficulties of their mysterious metamorphoses, and unconscious of any prevailing associations, on the apparent absence of which he had been prompted to dwell in the first instance.

Had he however been aware that those appendages were really mesothoracical organs; had he known that the little active hexapods since so frequently met with in the larviform females, were in fact their own progeny, in their primary form; and that, moreover, from similar minute pediculiform larvæ many Coleoptera belonging to the *Rhipiphoridæ* and *Meloïdæ* are developed: it can hardly be doubtful that Kirby himself would have been fully persuaded that these circumstances furnished the desired clue to their affinities.

(*e*) Newman, "Zoologist," Londini, 1847, p. 1792; Newman, *idem*, Londini, 1850, p. 2684; Schaum, Catal. Coleopt. Eur. Ed. 1a, Berolini, 1852.

(*f*) Lacordaire, Gen. Coleopt. Tom. V. pars. 2, p. 634, 1859.

(*g*) Monogr. Apum. Angl. Vol. II. p. 112, 1802.

(*h*) Trans. Linn. Soc. Lond., Vol. XI. p. 99, 1811-13 (Note). Kirby & Spence, Introd. to Entomology, Vol. III. p. 589, 1826 (Note).

(*i*) Trans. Linn. Soc., *ubi supra*, p. 98.

(*k*) *Ibid*, p. 111.

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Thus, the general principles laid down by him in certain rules and formularies as justifying the separation of these insects from other Orders (*l*) are inapplicable, or have rather an opposite tendency, more especially when, even in the absence of all information as to their primary affinities, Kirby already considered their "*metamorphosis nearer to that of Coleoptera*" than to that of any other "*elytrophorous order*" (*m*).

All the arguments which have been suggested in opposition to such an alliance appear to me to have been already triumphantly refuted by Dr. Schaum, as set forth *in extenso* by Lacordaire in his carefully collected details upon this subject (*n*); nor indeed can it be conceived that these primary larvæ, of assimilated forms, should belong to different orders, or expected that (in the great struggle of life, wherein structural characters assume various degrees of development, or become altogether rudimentary, in accordance with functional discipline) they should be endowed with the self-same buccal organs, notwithstanding the differences of their respective habits; whether destined to *penetrate* into the bodies of their larval victims in the first instance, and afterwards to become *external* feeders thereon, as in *Rhipiphorus* (*o*); or to remain comparatively *innocuous* as *internal* dependents upon their foster-parents, as in *Stylops* and its allies; or whether, abjuring the habits of either as alike uncongenial, they are addicted to feed upon the *egg* of their victims in the first stage of their existence, in order to monopolize the *honey-store* of the former in the second stage, as in *Meloë* and *Sitaris* (*p*).

Moreover these organs are found to vary in the same identical species at different periods, according to the respective requirements of larval development. Thus, in M. Fabre's most interesting and elaborate memoir on the

(*l*) Ibidem, pp. 94, 95.

(*m*) Ibidem, p. 108.

(*n*) Lacordaire, Genera des Coleoptères, 1859, Vol. V. (part 2) p. 641. Schaum, Wiegm. Archiv. 1851, II. p. 200. Siebold, Stettin Entom. Zeit. 1853, p. 133, idem (Abstr.) Trans. Ent. Soc. Lond., ser. 2, Vol. II. (Proc.) p. 124.

(*o*) Dr. T. Algernon Chapman, Ann. and Mag. of Natural History, 4th series, Vol. VI. London, Oct. 1870.

(*p*) Fabre, "Mémoire sur l'Hypermétamorphose et les mœurs des Meloides," in Ann. des Sci. Nat. 4e Sér. Zool. Vol. VII. p. 299, Paris, 1857.

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habits of the *Meloïdæ* above referred to, it is shown that in the primary larva of *Sitaris* the mandibles are *acute* and *recurved* ('aigues et recourbées,' p. 317), well adapted for the purpose of lacerating the delicate tegument of the egg (pp. 328, 329), that in their secondary form, as feeders on honey, these organs become small, *obtuse*, and *excavated* or *spoon-shaped* within ('obtuses et excavées au côté interne en forme de cuiller,' p. 335), and that in a subsequent stage, which he designates as "*la troisième larve*," they again revert to a *very acutely pointed form* ('en pointe très aigue,' p. 341).

Nor under anomalous circumstances of development and metamorphosis, amid diversified conditions and aberrant forms, can it be considered so extraordinary that the *Stylopidæ* should participate with such abnormal types, in their divergence from conventional formularies of organization, although in many respects closely allied with several Coleopterous groups, distinguished from all others by *the same parasitic associations* (*q*), and, so far as hitherto ascertained, by *the same primary larval conditions, unlike those of any other known race:* as with *Myodites* in their rudimentary elytra and neuration of wing; with *Rhipiphorus* and *Emenadia* in the longitudinal folding of the latter; with *Rhipidius* in their eyeless apterous females; with the males of all the aforesaid in their highly developed ramose antennæ; nor less so with *Meloë*, *Sitaris* (*r*), and *Zonitis* (*s*), in their remarkable coarctate pupal metamorphosis, and preliminary larval transformations.

While, therefore, harmonizing with these Coleopterous types in so many points of habit, structure, and analogy, from the first to the last stages of their existence, the additional evidence which time has thus brought to bear upon such intrinsic relations and affinities, may well suffice, in accordance with Latreille's suggestion (*t*), to rescue them from unmerited severance and seclusion.

(*q*) Lacordaire; Gen. d. Coleopt. Tom. V. p. 631.

(*r*) Fabre; *loc cit.*, p. 321 (*Sitaris*); p. 353 (*Meloe*).

(*s*) Giraud; Ann. Soc. Ent. de France; ser. 4, Tom. VI. (1866) p. 494 (*Zonitis mutica*). Fabre; *ubi supra*, Tab. XVII. fig. 9 (?).

(*t*) Tempus ducamus, et dies alteri lucem afferrent. (Gen. Crust. et Insect, Tom. IV. p. 388.)

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It may scarcely be fitting to dismiss the subject of these affinities, without adverting (however briefly) to the arguments which have been advanced, from time to time, as justifying the association of this family with various orders, or indicating connecting links with several of them.

Although the relations suggested in this respect have, in fact, been so numerous and complex, as almost to have rung the changes throughout these orders; it was reserved for a distinguished entomologist of late, to complete the series, by absorbing the *Stylopidæ* into his *Neuroptera*, as a family allied to the *Phryganeidæ* (*u*).

Dr. Gerstäcker had already repudiated the primitive larval and metamorphotic affinities of the *Stylopidæ* with the *Meloidæ* (unknown to former writers, prior to the interesting discoveries of Siebold in 1843, of Newport in 1847, and of Fabre in 1857, elsewhere referred to), because in the one case, the larvæ subsist upon the bodies of their victims, and in the other upon their honey-store (*x*).

But the self-same primitive larval analogy has more recently been detected in the Coleopterous parasite of the Wasp, as recorded by Dr. Algernon Chapman in his "Life History of *Rhipiphorus paradoxus*" (*y*), which may well serve to reconcile all scruples as regards the twofold associations of the *Stylopidæ* with the *Rhipiphoridæ* on the one hand, and with the *Meloïdæ* on the other.

Previously, however, to this discovery, our lamented member, Dr. Schaum, had confuted, with his usual ability (*z*), the objections raised by Dr. Gerstäcker as to the alleged incongruity of any such relations; rebutting the arguments advanced in support of their transfer to the *Neuroptera;* and calling attention to the striking analogy subsisting between the former and the larviform females of *Rhipidius blattarum*, whose primitive larvæ (still unknown) may not improbably be found to correspond with those of *Rhipiphorus* (*Metœcus*, Gerst.), *Meloë*, and *Sitaris*.

(*u*) Handbuch der Zoologie, Tom. II. p. 78, 1863. 3. Zunft. *Strepsiptera*, Kirby (*Rhipiptera*, Latr.), Fächerflügler. 5 Fam. *Stylopidæ*, Kirby.

(*x*) Wiegm. Archiv. 1861, p. 328.

(*y*) Ann. and Mag. of Nat. Hist. ser. 4, Vol. VI. p. 314, 1870.

(*z*) Wiegm. Archiv. 1863, p. 145.

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I also possess a female of the allied genus *Myodites*, to the body and legs of which fifteen hexapod larvæ, differing from any hitherto met with, are firmly attached.

On the other hand, it would seem difficult to conceive how the *Stylopidæ* can be considered by Dr. Gerstäcker as a Family naturally associated by its essential characters ("schliesst sich durch ihre wesentlichen Charaktere naturgemäss") with the *Neuroptera* in general, and the *Phryganeidæ* in particular (*a*).

Nothing, in fact, can be more dissimilar in their structure and adaptation than the stunted, leathery and veinless mesothoracical appendages ('Stummeln') of the former, as compared with the expansive membranous corresponding organs of flight, with branching veins, of the latter, unless exceptionally rudimentary in *both pairs*, as Dr. Schaum has pointed out (*b*); nor less so, the remarkable characteristic differences in the antennæ, which are long, setaceous ('borstenförmig') and multiarticulate in the *Phryganeidæ*; while also utterly irreconcilable in their *aquatic* habits, their peculiar self-constructed larval abodes, their independent existence, and entire series of transformations from ovum to imago.

Little attention has hitherto been paid to the neuration of the wings (*c*) in Strepsipterous insects; nor indeed has much regard to accuracy been observed in the delineation thereof. In the figures of *Xenos Peckii* by Bauer, in 1811 (*d*), and of *Xenos Rossii*, K. (*X. vesparum*, Rossi) as supplied by Jurine in 1816 (*e*), the neuration essentially differs; nor have any verbal explanations thereof been afforded in either case.

Curtis has supplied a description of the wings of his *Halictophagus* (1832); but scarcely in an intelligible form, without the aid of the figure itself to interpret his meaning; while in his *Stylops Dalii* (1828) this character is hardly noticed, and only indefinitely adverted to in his *Elenchus* (1831). But although these wings are, in all

(*a*) Handbuch; p. 79.

(*b*) Wiegm. Archiv. *loc. cit.*, p. 147

(*c*) I have applied to the *veining of the wings* throughout, the designation of "*neuration*," "*neura*," &c.; in order to be consistent with the references made herein to Kirby's names for these veins, without alteration.

(*d*) Linn. Trans. *loc. cit.*, Tab. IX. fig. 1.

(*e*) Memorie della R. A. delle Scienze di Torino, Tom. XXIII. p. 50, 1818.

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cases, constructed more or less in accordance with one uniform type, it is fitting that some general principles should be laid down, whereby comparisons may be instituted, and all definitions framed upon a common basis.

Among the wings of the several orders of insects, set forth with the utmost care and precision by Kirby and Spence, in their celebrated "Introduction to Entomology" (Vol. III. Pl. X), the only example affording any obvious analogy in this respect, is that of the Coleopterous type (fig. 4).

In this indeed, as notably described in the text itself (p. 626), "the first thing that strikes the physiologist in surveying a wing belonging to an insect of this order, is the general arrangement of the *nervures;* which are so placed that the required degree of tension may be given to every part of this organ: thus, some are nearly *straight;* others run in a *serpentine* direction; others are *forked,* with one branch recurrent and another proceeding onwards; others again are *insulated,* or do not originate from the base of the wing, or from other nervures, but are merely placed to strengthen an open space of it. Another striking circumstance with regard to them is, that the nervures form few or no closed areolets, except in the costal area, where they are inconspicuous." Who would not suppose, after careful comparison, that this lucid description of a Coleopterous wing had been expressly founded upon one of the *Stylopidæ,* as the selected type?

Kirby elsewhere observes (*f*) that in the latter, "the veining of the wings is very simple," and that "in this they somewhat resemble the Coleopterous genera" (*Hister, Necrophorus,* &c.) which he quotes; but while noticing also that "they fold longitudinally," it is remarkable that he should have been led to look rather to the *Orthoptera* than to the *Rhipiphoridæ* for an affinity in this respect.

In proceeding to a more minute examination of the several nervures, as adverted to by Kirby and Spence in their Synoptical Table of Nomenclature (p. 353) and in the subsequent description of the nervures themselves (pp. 374, 375, 626), we find, in the first instance, that in the metathoracic wing of the *Stylopidæ,* the *costal* nervure (neura costalis) is thickened at its base in

(*f*) Linn. Trans. Vol. XI. p. 101.

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conjunction with the short *mediastinal* nervure, more or less separate and distinct in itself; followed by the *postcostal*, furcating at its base with the *externo-medial* or "*third principal nervure of the wing*," traversing the disc more or less, and corresponding (as it would seem) with what Kirby has described as the "transverse fold in the middle" of a Coleopterous wing (Linn. Trans., *l. c.*, p. 101); in some instances continued to the exterior margin, as in *Myodites* and *Rhipiphorus*.

Kirby and Spence divide the fore-wing into three areas, namely the *Costal* (*Area costalis*), the *Intermediate* (*Area intermedia*), and the *Anal* (*Area analis*); the *first* of which comprises (in *Coleoptera*) "that part of the wing lying between the anterior margin and the postcostal nervure:" the *second*, "that part of the wing lying between the costal area and the anal nervure:" and the *third*, "that part of the wing which lies between the anal nervure and the posterior margin." The externo-medial nervure as aforesaid may serve to divide this intermediate area into two sections, which I have defined in the following pages as the *upper* and *lower* intermediate areas (*area intermedia superior* and *inferior*); the former of which is usually furnished (as in *Myodites* and *Rhipiphorus*) with *two insulated nervures*, either *double* or *single*, extending backwards from the exterior margin, though not always in connection therewith; situated between the costal area and the transverse externo-medial nervure; the *first* being near the apex of the wing and nearly parallel to the costa (*neura prima insulata apicalis*); and the *second*, between the first and the externo-medial (*neura secunda insulata discoidalis*), usually longer than the first, and frequently brought into close proximity with the externo-medial itself, so as to appear in some cases almost furcate therewith, although typically insulated. Some of the other nervures also exhibit a tendency to assume a double form.

The lower intermediate area presents always an uniform type of *three* somewhat approximating nervures radiating from the base of the wing, inspissated from their origin and becoming exceedingly slender beyond the centre, although prolonged in a straight line to the exterior margin. These nervures may be considered to correspond with the *interno-medial* (or "*fourth principal nervure*"), the *subinterno-medial*, and the *anal*, of Kirby and Spence.

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Furthermore, a very delicate, straight, continuous nervure, intervenes in all cases about midway between the externo- and interno-medial, corresponding with the *subexterno-medial* of the same writers (*ibid.* p. 375).

In some cases, the faint trace of a spurious supplementary nervure (neura spuria, *ibid.* p. 376) would seem to exist between the subinterno- and interno-medial nervures, which, not being constant, even in the *same species*, can only be regarded as abnormal.

Thus, all the elements of the metathoracical wing defined as the normal type in Coleoptera, are distinctly portrayed; coupled also with the "*striking circumstance*" already adverted to, that "*few or no closed areolets*" are to be found therein.

These results, with the principal nervures brought prominently forward, may be tabulated as follows:—

Neurarum Alæ Synopsis.

Area Costalis, *K.*		*a.* Neura costalis, *K.*
		b. Neura mediastina, K.
		c. Neura postcostalis, *K.*
Area intermedia, *K.*	Superior.	*d.* Neura 1a insulata (*apicalis*).
		e. Neura 2a insulata (*discoidalis*).
		f. Neura externo-media, *K.*
	Inferior.	*g.* Neura subexterno-media, *K.*
		h. Neura interno-media, *K.*
		i. Neura subinterno-media, *K.*
		k. Neura analis, *K.*
Area analis, *K.*		*l.* Margo analis.

The structure of the antennæ, which vary in the terminal joints, exhibits a certain uniformity of organization in the three basal joints; the *stipes* consisting in all cases of *two* short joints (*g*); the *third* being invariably produced into a divergent *exarticulate branch;* and the *fourth* emanating from the base of the latter.

(*g*) Kirby, in his general characters, defines the antennæ as "basi *stipite communi* crasso bi-vel triarticulato" (Linn. Trans., *l. c.*, p. 109); and in *Xenos* (p. 114) he describes them as "stipite triarticulato." So also in the description of his Tab. IX. fig. 10, b, "the triarticulate stipes of the antennæ" (p. 121) in *Xenos Peckii* is indicated; the third joint, as represented in the plate, being in reality the *basal cup of the first exarticulate branch.* Siebold also in his *X. sphecidarum* (N. Schrift. d. Nat. Gesch. 1839, p. 79) defines the stipes as triarticulate, the *third* joint being the *shortest.* (For position of *exarticulate branch, vide* post, p. 21.)

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By the discriminating characters derived from the shape and number of these several joints (which, in conjunction with certain differences in those of the tarsi, have served as a basis for generic distinctions, and are also found to maintain a constant restriction to certain exclusive associations of birth and origin), it may as readily be determined to which section of the *Stylopidæ* any nurturing race or foster-parents may have afforded sustenance, as *vice versâ* to which tribe of the latter any of the aforesaid should be affiliated, in so far as such connecting links have been duly ascertained in other cases.

Hence it would seem to follow, as a necessary corollary, that all combinations of such genera into natural groups or *subfamilies*, should be made in accordance with their respective alliances; whereby these associations may be consistently defined and maintained. In fact, there is no other possible criterion for properly assorting the *females*, than by classifying the nurturing species themselves in conjunction therewith.

The genus *Xenos*, however, as at present constituted (by reason of a mere coincidence in the number of joints in the antennæ and tarsi), is subject to the controlling destinies of different families and tribes, so widely separated from each other in the most vital elements of their existence, as to render any artificial union between their respective dependents, founded upon this limited basis, utterly irreconcilable with such obvious incompatibilities of origin and descent.

Thus the true *Xenides* consorting with the social *Vespidæ*, must be reared from their primary hexapod condition in from *thirty* to *forty days*: such being the term within which the larvæ of the Social Wasps attain the imago state; the females of the latter *hybernating* with those of the former, which produce their larval brood the *ensuing year*.

In marked contrast with these hybernating *Xenides*, which, from the peculiar exigencies thus imposed, are *slow* to produce their larval brood from females of the *preceding year*, but *rapid* in their ultimate metamorphoses; others have been comprised in the same group, which are nurtured by the larvæ of solitary wasps and fossorial *Hymenoptera*, these latter tribes coinciding more or less in their habits and economy, and requiring about *eight* or *nine months* (from one year to the next) to attain

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maturity; involving a corresponding detention for their associated dependents: which, after their long protracted larval condition as aforesaid, must, from the same inevitable necessity, produce their young the *self-same year* in which they themselves complete their transformations, in order that (like the *Stylopides*) their brood may obtain access to the future larva-cells of their *non-hybernating* foster-parents.

These very distinct groups must necessarily be divided into different subfamilies, readily distinguished from each other; the true *Xenides* (nurtured by the *social wasps*) having the two exarticulate branches of the antennæ tapering, sinuous, and divergent; whereas in the others, which I would distinguish as *Pseudoxenides*, they are compressed, forcipate, and recumbent.

This latter group, however, as thus separated from the true *Xenides*, comprises in itself the fosterlings of two very dissimilar tribes; namely, of the *Eumenidæ*, and other solitary wasps on the one hand, and of the *Sphegidæ*, with their fossorial allies, on the other. When, therefore, we find, in other instances, different genera, and different species, of the *same nurturing tribe*, maintaining exclusive associations with their respective foster-dependents, how much the more might not the same principles be held to apply to the dependents of *different tribes*, not indeed so utterly irreconcilable with each other, as to preclude all possible intercommunion of race between such subsidiary groups from adventitious circumstances?

It remains, therefore, to be seen, how far the lines of demarcation which separate these fostering tribes may be more or less ostensibly reflected in their foster-progeny.

But, amid the numerous instances in which the exuviæ of male *Stylopidæ*, or their derelict females, have been met with among the different genera of *Fossores*, Latr. (as tabulated in the sequel), the European *Xenos Sphecidarum*, and the Brazilian *Xenos Westwoodii*, described and figured in our Transactions by Mr. Templeton (*h*), have alone been detected hitherto in the winged form; to which I am now enabled to add a third species obtained on several occasions (both males and females) from one of the European *Nyssonidæ*.

(*h*) Second series; Vol. III. p. 51.

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This species appears to correspond with Mr. Templeton's, in the structure of the basal joints of the antennæ; and likewise in the peculiar conformation of the third joint, which (as in the Brazilian species), is "suddenly turned off at right angles;" both branches being tumid and distorted; and although in the latter, the *fourth* joint is described "as about one-fourth part" *longer* than the *third*, this would hardly seem to constitute a reliable generic character, for the converse appears to be the case in *X. Sphecidarum*, where the *penultimate* branch or *inner* article (innere Glied) is stated by Dr. Siebold to be *always somewhat longer* than the *terminal* or *outer* one (*l. c.*, p. 79); while in my species, there would seem to be no perceptible difference in their respective length. The Senator Von Heyden also mentions a *Xenos* which he had obtained from *Polistes gallicus*, in which the branches of the antennæ "*were very unequal in length*" (Tr. Ent. Soc. Lond., Tom. 1, p. lxxiv.).

But I also obtained from a specimen of *Epipone spinipes*, L. (captured in the vicinity of the burrows of the *Bembecinus*, from which the preceding species was derived), three other males so closely corresponding therewith, in the peculiar distorted conformation of the antennæ, essentially different from the straight flattened branches of those which I have found with other *Odyneri*, that, although emanating from two distinct nurturing tribes, they would seem to be congeneric, if not otherwise identical.

Hence it follows, that in those cases where the economy and habit of the fostering races correspond, no distinctive limits can be affixed to the foster-progeny, which, under such circumstances, may be equally adapted to abide with either.

From the uncertainty which attaches to a considerable number of fosterlings whose existence alone, as associated with various genera and species of these nurturing tribes, has hitherto been recorded, but of whose characters no information has yet been obtained, it would seem far from improbable that many novelties have yet to be detected among these occult forms; whereof one of the most remarkable has been dimly foreshadowed in the exuvial traces of an allied race among the *Homoptera*, as adverted to in the concluding paragraph (*vide post*, p. 48).

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Characteres e maribus desumpti.

(Descriptiones Kirbianæ mutatis mutandis.)

Corpus oblongum, subcylindricum, cute corneâ, cataphractum.

Caput sessile, trunco latius, transversum, magnum.

Os cum labro, labio, et maxillis (*i*) obsoletum et vix ullum.

Mandibulæ [*maxillæ*, Curtis (*k*)] corneæ, elongatæ, lineares, angustissimæ, edentulæ, apice forficatæ, acutæ, sub capite apud basin palporum intus insertæ.

Palpi duo biarticulati, valde distantes, sub capite inserti. [In Paraxeno Westwoodii triarticulati? *vid. post* p. 47.]

Antennæ inter oculos in acetabulo frontis insertæ; 4, 5, 6, vel 7-articulatæ, stipite biarticulato, articulis brevissimis, articulo tertio saltem in ramum exarticulatum producto.

Oculi magni, plus minusve pedunculati [vel subsessiles —*Elenchus*], capite porrecti, hemisphærici, hexagonis crystallinis planiusculis septo elevato separatis.

Truncus oblongus.

Prothorax collariformis, brevissimus, transversus.

Mesothorax (*Dorsolum*, Kirb.) transversus brevis, elytris angulis anticis utrinque affixis.

Metathorax ingens; *scutello* [*præscuto*, Audouin (*l*)] subtriangulari, inter alarum angulos basales posito (*m*); *lumbi* [*epimera*, Aud.] magni, latera trunci fere tota occupantes, subrhomboidales, convexiusculi, lateribus deflexis, concavis; *interlumbium* [*scutum*, Aud.] triangulare, vertice acuminato; *postlumbium* [*scutellum*, Aud.] declive aut verticale, breve, transversum, corneum vel membranaceum; *proscutellum* [*postscutellum*, Aud.] conicum, subcalceoliforme, productum, convexum, ascendens, abdominis basin obumbrans et muniens, subtus cavum.

(*i*) Kirby, Trans. Linn. Soc., *loc. cit.*, pp. 108, 109.

(*k*) Curtis, Brit. Entom., Fol. 226, 385.

(*l*) Audouin, Ann. Sci. Nat. Tom. I. pp. 97, et 416.

(*m*) Kirby, *loc. cit.*, p. 105, Tab. IX. fig. 1, 2*e*.

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Pectus et *Sternum* sub pedibus anticis delitescentia, vix discernenda.

Peristethium (Illiger) a pedibus intermediis omnino occultatum.

Scapularia (Illiger) subtriangularia, ante basin alarum posita (Kirby, fig. 4c).

Pleuræ (Illiger) longitudinales, latiusculæ, et ferè lanceolatæ (*ibid*, fig. 4 d).

Parapleuræ (Illiger) longitudinales, sublineares, anticè attenuatæ, apice subclavatæ et inter basin alarum et scapularia interpositæ, pleuris a parte inferiori parallellæ (*ibid*, fig. 4 e).

Mesostethium (Illiger) amplum, subpanduriforme, posticè medio longitudinaliter canaliculatum; *mediosterno* aut *poststerno* exstante nullo (*ibid*, fig. 5a).

Femoralia magna, crassa, apice rotundata, posticè attenuata, basi gibba, abdomen utrinque munientia (*idem*, fig. 1, 2, 1 l).

Elytra lateralia, distantia, distorta, coriacea, linearia vel ferè cochleariformia, alas nullo modo tegentia.

Alæ amplæ, submembranaceæ, circuli quadrantis figurâ æmulæ, longitudinaliter plicatiles, radiatæ [sive neuris plurimis divergentibus, aliisque insulatis]. (Vide ante neurarum tabulam synopticam.)

Pedes compressi, anterioribus 4 approximatis, posticis remotis.

Coxæ anteriores 4 minimæ, vix distinguendæ; posticæ longiores magis conspicuæ.

Trochanteres femorum basin omnino intercipientes; anterioribus 4 elongatis, magnis, femoribus longitudine ferè æquales; posticis brevioribus, coxis subæqualibus.

Femora ferè semiovata.

Tibiæ apicem versus sensim crassiores, inermes.

Tarsi 2- 3- vel 4- articulati; articulo primo reliquis longiori; sequentibus ferè obconicis, subtus membranâ vesiculari suffultis, apice dilatatis, emarginatis; extimo mutico.

Abdomen marginatum, molle, segmentis octo, podice minuto lineari adunco supra terminatum; subtus processu genitali longiusculo, lineari, styliformi, reflexo, basi dilatato, munitum.

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Characteres e fœminis desumpti.

Fœmina aptera, larviformis, cui oculi, antennæ, trophique desunt; vivipara, abdomine intra corpus altorum latente; cephalothorace tantum projiciente. Hic squamosus, corneus, obtusus, basi in cervicem contracto, cochleariformis, capite cum pro- meso- metathoraceque (segmentis quatuor) in unum conjunctis; disco superne convexo, subtus concavo, angulis posticis subinflatis; stigmate unico laterali utrinque basin versus (*n*), vel marginis sub tegmine celato (*o*); æsophagi aditu superficiei convexæ apicem versus (*p*); processu corneo, minuto transversali (seu mandibula rudimentaria (*q*)) in nonnullis, tuberculove porrecto palpiformi in aliis (*r*), utrinque posito; paulo retro arcu subelevato (ubi in marium pupariis operculi sutura invenitur), quo canalis vaginalis introitus adest.

Abdomen segmentis novem, molle, oblongo-ovale, amplum; saccum flaccidum absque aditu anali constituens; canale interno incubationis lato superne jacente; in quem per aditus parvos, rotundos, tres usque quinque, per cutem pellucidam segmentorum abdominalium secundi, tertii, quarti (*s*), nonnullis quintique (*t*), aliis etiam sexti (*u*), translucentes, tot tubi antice curvati ab antro ventrali seriatim ducunt, quibus ingressibus larvæ primitivæ inter ovaria lacerata vagantes, atrium petunt ut denique per vestibulum thoracicum gradatim evadant.

(*n*) Kirby, Trans. Linn. Soc. Lond., *loc. cit.*, Tab. VIII. fig. 4; Siebold, N. Schrift. d. Naturforsch. Gesellsch. in Danz. 1839; III. 2, p. 74, Tab. III. fig. 62, a, a.

(*o*) Siebold, Wiegm. Archiv. 1843, p. 149, Tab. VII. 4c, c (*X. Rossii*).

(*p*) Siebold, *ibid.*, p. 140, Tab. VII. fig. 3, 5e; Westwood, Trans. Ent. Soc. Lond., ser. 2a, Tom. 1, Tab. VIII. fig. 2i.

(*q*) Siebold, Wiegm. Archiv. *loc. cit.*, Tab. VII. fig. 3, 5, 14e** (*Xenos*); Westwood, *ubi supra*, ser. 2a, Tom. II. Tab. XV. fig. 23 (*Pseudoxenos*).

(*r*) Westwood, *ubi supra*, ser. 2a, Tom. I. Tab. VIII. fig. 2a-i (*Hylecthrus*); Westwood, *ubi supra*, ser. 2a, Tom. II. Tab. XVI. fig. 15, 16, 17, 20 (*Hylecthrus*).

(*s*) Siebold, N. Schrift. *l. c.*, pp. 75, 85, Tab. III. fig. 62, c, c, c (*X. Sphecidarum*).

(*t*) Siebold, Wiegm. Archiv. *l. c.*, pp. 149, 161, Tab. VII. fig. 1g* (*X. Rossii*).

(*u*) Siebold, Wiegm. Archiv. *l. c.*, pp. 141 (sect. 18) et 149 (*Stylops*).

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Metamorphosis.

Larva primitiva ab ovo in corpore materno maturatur, hexapus, saltatoria, elongata, convexa, coriacea, segmentis 13, tuberculis analibus exclusis (*x*), setâ longâ caudali utrinque; capite plano semicirculari, angulis posticis stemmatiferis (*y*); antennæ minimæ (*z*) vel obsoletæ (*a*); pedibus motu anomalo, sese duplici serie anticè posticè trajicientibus (*b*); tarsis inarticulatis, unguibus nullis. *Xenidum* larvæ primitivæ pedibus anterioribus 4 tarsorum apice carneo, inflato, vesiculari (*c*); posticis simplicibus; *Stylopidum* larvæ tarsis minus dilatatis.

Hæ larvæ primitivæ, ut altorum in nidos transferantur, apud matrem cum altoribus restant, donec in cellulas evadentes, intra corpus larvarum penetrantes, post hebdomadam pelliculâ dejectâ metamorphosin perficiunt (*d*); atque sub formâ secundariâ molli albâ apodâ videntur; segmentis decem, quorum unum cephalothoracicum magnum subnasutum, larvæ primitivæ segmentis 4 anticis æquivalens; marium ultimo acuminato (*e*); fœminarum ultimo rotundato (*f*).

Larva secundaria (marium) *adulta*, altoris ultimâ metamorphosi vix subitâ, naso corneo subobtuso, alternatim transversè dextro sinistroque operando, per membranam tenuem inter abdominis segmenta aditum perrumpit; ubi segmentorum anteriorum cutis mollis sensim induratur.

Fœminarum larva secundaria, cephalothorace projiciente, uti sub fœminæ descriptione ante narratur; vix ultra mutatur.

(*x*) Westwood, Trans. Ent. Soc. Lond.; ser. 1a, Tom. II. p. 184, Tab. XV. fig. 13 (*Stylops*; ser. 2a, Tom. I. Tab. VIII. fig. 3 (*Hylecthrus*). Siebold, Wiegm. Archiv. *loc. cit.*, Tab. VII. fig. 15 (*Xenos*); Siebold, ibidem, Tab. VIII. fig. 16 (*Stylops*). Newport, Trans. Linn. Soc. Lond. Tom. XX. pp. 341-343, Tab. XIV. fig. 21, 22 (*Stylops*).

(*y*) Siebold, *ubi supra*, p. 155, Tab. VII. fig. 15 *l* (*Xenos*).

(*z*) Siebold, ibidem, Tab. VII. fig. 16m (*Stylops*).

(*a*) Westwood, *loc. cit.*, ser. 1a, Tom. II. p. 185 (*Stylops*). Newport, *loc. cit.*, p. 362.

(*b*) Westwood, *loc. cit.*, sec. 1, Tom. II. p. 186.

(*c*) Siebold, *ubi supra*, fig. 15 (*X. Rossii*).

(*d*) Trans. Ent. Soc. Lond., ser. 2, Tom. II. p. 127 (*Xenos*).

(*e*) Siebold, *loc. cit.*, sect. 12, p. 139, Tab. VII. fig. 10, 11, 12.

(*f*) Siebold, *loc. cit.*, sect. 12, p. 139, Tab. VII. fig. 6, 13.

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Mas tamen externè in puparium cylindricum, operculo capitis convexo, subrotundato (*Stylopidum*), vel transversè compresso, subarcuato (*Xenidum*), anticè tuberculato, oculorum situ fenestrato, convertitur; imprimis lacteum, nasi circuitû oculorumque regione tantum brunneis; tunc cito corneum, castaneum vel piceum extra fit, cephalothorace basin versus stigmate unico minuto utrinque instructo (*g*).

Intrà puparium nympha (seu pupa vera) pallida, cuncta imaginis organa exhibens, conformatur; quæ brevi nigricans, intraque hebdomadam ferè pelliculâ dejectâ, ad operculum propinquans, per latera fenestrata, quibusdam (*Xenidibus* et *Pseudoxenidibus*) fenestrulis hexagonis instructa (*h*), circumspicit, ut in horâ propitiâ, luce instigante, capitis impetû operculum dejiciat et per auras imago emancipata evolet.

Annotatio. De formâ primitivâ pupæ veræ, ut in *Sitaris* casu a Clar. D. Fabro sub *larvâ tertiâ* narratur et delineatur (*i*), in *Strepsipteris* nihil adhuc constat. Talis metamorphosis transitoria *intra puparium* in quo denique, pelliculâ iterum dejectâ, ipsa pupa (seu nympha) evolvitur, ut *pseudo-pupæ* potius quam larvæ redivivæ characteribus induta, mihi existimanda videtur.

In *Meloë*, cujus metamorphoses jamdudum a Domo. Newport descriptæ fuere, "*larva-adulta* seu *pseudo-larva*" ab ipso in tabulâ "*cum pedibus*" delineatur et explicatur (*k*), quare cum "*pseudo-chrysalide*" Fabri haud identica foret, ut ab illo existimatur (*l*). De ultimâ tamen a D. Newport vix perspicue narratur, et quasi per saltum ad "*nympham seu pupam in pseudo-larvæ cute*

(*g*) Siebold, *loc. cit.*, sect. 12, p. 139, Tab. VII. fig. 7, 8, c.

(*h*) Kirby, *loc. cit.*, p. 115, Tab. VIII. fig. 7, a. Siebold, *loc. cit.*, Tab. VII. fig. 9, i.

(*i*) Fabre, *loc. cit.*, pp. 340, 365, Tab. XVII. fig. 5. Lacordaire, *loc. cit.*, p. 638.

(*k*) Newport, Trans. Linn. Soc. Lond., Tom. XX. (pars 2) pp. 320, 356, Tab. XIV. fig. 15-17, 1847.

(*l*) Fabre, *loc. cit.*, p. 356.

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dejectâ suâ involtam" transgreditur. Sed quæ in *Sitari* eadem quoque in *Meloë* transformatio intermedia, a D. Fabro verificata, fit (*ibid.* p. 358).

In *Rhipiphoro paradoxo* larva adulta (absque pupario) mox a Dre. T. A. Chapman descripta et delineata est (*m*), quamvis de metamorphosi ejusdem in pupam veram hodie ignoramus. *Rhipiphororum* tamen larvas primitivas plures intra *Vesparum* larvas (ut pariter a *Stylopidis* efficitur) detexit; quæ posteà exeundo metamorphosin subeuntes, pelliculâ in aditu relictâ, larvas ipsas ab externo vorant.

Sitarium et *Meloïum larvæ secundariæ* de melle viscoso in *Anthophorarum* cellulis aluntur; quæ in statu primitivo unicum pabulum ab ovo petunt; quod vix elabens ab oviductu dexterrime attinent, ubi contactus glutinosus fatalis fuisset (*n*).

Hi omnes tamen, quamvis inter se anomali; moribus divergentibus, metamorphosi variâ, trophis mutabilibus (*o*), pabulo diverso, characteribus Proteis; ad *Stylopidas* plus minusve appropinquantes, in vinculis affinitatis colligantur; in familiis proximis, ut opinor, cum iisdem consociari debent.

Observatio. E larvæ primitivæ trophis in fœminarum cephalothorace subversis (*p*) constat ut superficies convexa quæ ab abdomine altorum extus exhibetur, regionem ventralem, concavaque subtus dorsalem, constituunt. Maribus tamen, ob altorum segmenta abdominalia plus minusve constricta ut videtur, imagines nonnullæ (*Stylopidum*) cum pedibus super altorum segmenta sistentibus, aliæve (*Xenidum* et *Pseudoxenidum*) inversæ, declarantur; quo modo pariter larvæ adultæ cephalothorace exserto metamorphosin subeunt; *Stylopidum* operculo capitis subrotundo, *Xenidum* oblongo-transversali (*vide* in *Hylecthri* maribus larvæ adultæ et puparii positionem, ut in Trans. Ent. Soc. Lond. serie 2dâ, Tom. II. tab. xvi. fig. 6 * et 9 delineatur).

(*m*) Chapman, *loc. cit.*, p. 324, Tab. XV. fig. L.

(*n*) Fabre, *loc. cit.*, p. 326 (*Sitaris*); p. 353 (*Meloë*).

(*o*) *Ibid.* *Sitaris* larva *primitiva* mandibulis acutis, recurvis (p. 317); larva *secundaria* mandibulis obtusis, intus excavatis, cochleariformibus (p. 335); larva *tertia* (in pupario) mandibulis acutissimis (p. 341).

(*p*) Siebold, Weigm. Archiv. 1843, pp. 149, 152, 159, Tab. VII. fig. 14.

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SUB-FAMILIÆ.

Stylopidarum subfamiliarum divisiones secundum altorum affinitates, generum tamen propriâ structurâ, determinentur. Specierum definitiones adhuc editæ sæpe ambiguæ resultant, et potius e nutritoribus quam seipsarum characteribus discernendæ sunt. Fœminarum præcipue, nisi altoribus adjuvantibus, discrimina quasi desunt. Quamobrem in subfamilias quinque, propter consociationum diversitates, mihi distribuere visum est.

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§ *Synopsis subfamiliarum ab altoribus desumpta.*

Divisio A. Hymenopteroblæ.

Sub-familiæ.

Melliferorum Latr. incolæ	1.	*Stylopides.*
Formicidarum Leach incolæ	2.	*Myrmecolacides.*
Vespidarum socialium incolæ	3.	*Xenides.*
Vespidarum solitarium et Fossorium Latr. incolæ	4.	*Pseudoxenides.*

Divisio B. Homopteroblæ.

Fulgoridarum Leach incolæ	5.	

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§ § *Synopsis Generum e structurâ desumpta.*

Divisio A.

Sub-fam. 1. Stylopides.

Antennæ 7 articulæ.	Tarsi 3 articulati	. .	1.	*Halictophagus.*
„ 6 „	„ 4 „	. .	2.	*Stylops.*
„ 5 „	„ 4 „	. .	3.	*Hylecthrus.*
„ 5 „	„ 2 „	. .	4.	*Elenchus* (q).

Sub-fam. 2. Myrmecolacides.

Antennæ 6 (vel 7?) articulatæ.	Tarsi 4 articulati .	5.	*Myrmecolax.*

Sub-fam. 3. Xenides.

Antennæ 4 articulatæ. Tarsi 4 articulati . . Antennarum ramis *flexuosis*, tentaculiformibus, apice acutis . . . . . Alarum neuris insulatis ambabus simplicibus	6.	*Xenos.*

Sub-fam. 4. Pseudoxenides.

Antennæ 4 articulatæ. Tarsi 4 articulati. Antennarum ramis *tæniæformibus*, compressis; articuli 3tii cubito basali subrotundato; apice obtusis . . . . . Alarum neurâ insulatâ apicali duplice . . „ discoidali simplice .	7.	*Pseudoxenos.*
Antennarum ramis *distortis*, tumidis, compressis; articuli 3tii cubito basali prominulo, rectangulariter recurvo; apice obtusis . Alarum neuris insulatis ambabus duplicatis .	8.	*Paraxenos.*

Divisio B.

Sub-fam. 5. ———.

(Homopterabiarum characteres adhuc ignoti) .	9.	(r)

(q) An hujus sectionis (?) vide postea sub p. 24, not.

(r) The description and figure of the individual upon which this division is established, will be described by Professor Westwood in a subsequent article, in which figures illustrating some of the details contained in the present memoir will also be given.—J. O. W.

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Annotatio. Antennarum *articulus tertius,* in ramum exarticulatum productus, nunc *infrà,* nunc *extrà,* vel *intrà,* secundum genera et familias situm varium habet.

In *Halictophago,* lobi cuncti *externè* (at, antennis lateraliter deflexis, *posticè*) producuntur. In *Stylope,* ramus exarticulatus *infrà* (Kirby, 1813), sive *externè subtùs* (Westwood, Introd. Tom. II. p. 291, fig. 93, 5), evadet. In *Hylecthro,* hic ramus (antennis pariter deflexis) *retrò* locatur, alterum ramum *extrorsùm* ferens. In *Elencho* et *Myrmecolace,* ramus exarticulatus *lateraliter* vel *posticè* exstat.

In *Xenidibus* et *Pseudoxenidibus* rami præcedentibus *converse* positi sunt; nempe (antennis *porrectis*) articuli tertii pars producta quæ in *Stylopidibus* (antennis ita *porrectis*) ab *extrà* est, in his ab *intrà* conspicitur. Sin autem antennæ *transverse* dextrà sinistràque vertuntur, idem ramus (Artic. 3s.) qui in *Stylopidibus subtùs* vel *retrò* jacet, in his *antice* invenitur.

Divisio A. HYMENOPTEROBLÆ.

Sub-fam. 1. Stylopides.

Character essentialis.

Hymenopterorum melliferorum Latr. incolæ.

Stylopidæ hujus sub-familiæ intra larvas per plures menses alitæ, pari passu metamorphosin lente subeuntes, anno sequente simul cum ipsis altoribus in lucem evadere expectant.

Generis *Elenchi* status, sive cum *Melliferis* sive cum aliis consociandus, adhuc anceps.

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GENERUM ET SPECIERUM TABULA SYNOPTICA.

Genus 1. HALICTOPHAGUS, Curtis.

SPECIES.	SEXUS.	ALTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *H. Curtisii*, Dale.....	♂	*Halictus æratus*, Kirb.....	Anglia	Curtis, Ent. Brit. fol. 433.
——————?	♀	*H. minutus*, K.....	,,	Smith, Tr. E. S. Lond., ser. 2, Tom. V. p. 129.
——————?	♀	*H. nitidiusculus*, K.....	,,	*Ibidem.*
——————?	♀	*H. longulus*, Sm.	,,	,,
——————?	♀	*H. rubicundus*, Christ.....	,,	In Mus. Dom. Smithii.
——————?	♀	*H. obovatus*, K.....	,,	*Ibidem.*
——————?	♀	*H. quadrinotatus*, K.	,,	,,

Genus 2. STYLOPS, Kirby.

SPECIES.	SEXUS.	ALTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *S. Melittæ*, K.....	♂ ♀	*Andrena nigro-æmea*, K. ...	Anglia	Mon. Apum. Angl., *loc. cit.*
2. *S. Dalii*, Curt.....	♂ ♀	*A. labialis*, K.	,,	Curtis, Ent. Brit. fol. 226.
		A. barbilabris, K.....	,,	*Ibidem.*
3. *S. Childreni*, Gray.....	♂	*A. victima*, (?) Smith	Nova Scotia.	Griff., Cuv. Reg. Anim., *loc. cit.*
	♀	*A. desponsa*, Smith ..... (an præcedentis mas ?)...	,,	Smith, Mus. Brit. Catal. p. 114.
	♂ ♀	*A. placida*, Smith	America borealis	Packard, Guide, &c., p. 482, 1870.

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STYLOPS—*continued.*

SPECIES.	SEXUS.	ALTORES.	PATRIA.	BIBLIOGRAPHIA.
4. *S. Spencii*, Pick.	♂ ♀	*A. tibialis*, K.	Anglia	Trans. Ent. Soc. Lond. *loc. cit.*
5. *S. aterrima*, Newp.	♂	*A. Trimmerana*, K.	,,	Trans. Linn. Soc. Lond. *loc. cit.*
	♀	*A. pubescens*, Fab. (*rufitarsis*, K.)	,,	Pickering, Trans. E. S. Lond. Tom. I. ser. 1a, p. 168.
	♀	*A. fulvicrus*, K.	,,	*Ibidem.*
	♀	*A. Collinsonana*, K.	,,	*Ibidem.*
	♀	*A. Afzeliella*, K.	,,	*Ibidem.*
	♀	*A. Mouffetella*, K.	,,	*Ibidem.*
	♀	*A. picicornis*, K.	,,	*Ibidem.*
(*S. Thwaitei*, mihi)	♂ ♀	*A. convexiuscula*, K.	,,	Thwaites, Tr. E. S. Lond., Tom. III. ser. 1a, p. 67.
	♀	*A. bicolor*, Fab. (*Clarkella*, K.)	,,	Smith, Tr. E. S. Lond., Tom. V. ser. 2a, p. 132.
	♀	*A. nitida*, K.	,,	*Ibidem.*
	♀	*A. fuscata*, K.	,,	*Ibidem.*
	♀	*A. chrysosceles*, K.	,,	*Ibidem.*
	♀	*A. varians*, Rossi	,,	Pickering et Smith ubi supra.
	♀	*A. Xanthura*, K.	,,	*Ibidem.*
	♀	*A. parvula*, K.	,,	*Ibidem.*
	♀	*A. Gwynana*, K.	,,	*Ibidem.*
	♂ exuv.	*A. aprilina*, Sm.	,,	In Mus. Dom. Smithii.
	♀ ♀	,,	,,	*Ibidem.*
	♂ ♂ exuv.	*A. picipes*, K.	,,	,,
	♀	,,	,,	,,
	♀	*A. Rosæ*, Panz.	Epirus	In Mus. nostro.
	♀	*A. thoracica*, Fab.	,,	*Ibidem.*
	♀	*A. variabilis*, Sm.	,,	,,
	♀	*A. carbonaria*, Fab.	Ægyptus	,,
	♂ exuv. et ♀	*A. simillima*, Sm.	Florida	Smith ubi supra.

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Genus 3. HYLECTHRUS, Saund.

SPECIES.	SEXUS.	AUTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *H. rubi*, Saund.	♂ ♀	*Prosopis rubicola*, Saund..	Epirus.....	Tr. Ent. Soc. Lond. Tom. I. ser. 2a, p. 57.
	♂	Var. *P. versicolor*, Saund...	,,	*Ibidem.*
Var. *H. pustulatus*, Saund.	♂	(cum præcedentibus.)	,,	
2. *H. quercus*, Saund.	♂ ♀	*P. gibba*, Saund.	,,	*Ibidem*, p. 58.
3. *H. Sieboldii*, Saund. ...	♂ exuv. et ♀	*P. variegata*, Fab.....	,,	Idem, Tom. II. ser. 2a, p. 142.
——————?	♀	*P. signata*, Panz.	Anglia	In Mus. Dom. Smithii.

Genus 4. ELENCHUS, Curtis.

SPECIES.	SEXUS.	AUTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *E. tenuicornis*, Kirby...	♂	*Ignoti* *	Anglia	Tr. Linn. Soc. Lond., Tom. XI. p. 233.
2. *E. Walkeri*, Curt.	♂	,, ...	Anglia et Hibernia ..	Curtis, Ent. Brit., fol. 385.
3. *E. Templetonii*, Westw.	♂	,, ...	Insula S. Mauricii	Tr. Ent. Soc. Lond., Tom. I. ser. 1a, p. 173.
		An hujus sectionis (?)		

* Quamvis olim a Dom. Templetonio *Elenchus* ad *Bombos* refertus est, denique hæc notio seipso repudiatur (*loc. cit.*, p. 174) quia Insulâ S. Mauritii Bombi omnino desunt; dum nec *Polistium* nec *Eumenium* iisdem locis ædificantium inspectio solutionem præbuit. Nonne forsan cum *Formicis* (ut Myrmecolaci affinis) potius associandus?

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Genus 1. Halictophagus, Curtis.

Curtis, "British Entomology," Fol. et Tab. 433, 1832.

(*E descriptione Curtisianâ anglicè editâ.*)

Antennæ lamellatæ, 7 articulatæ; articulis basalibus 2 robustioribus subquadratis; reliquis singulis [*extimo excluso*] ramum subovatum externe producentibus, usque ad apicem longitudine sensim diminuentibus, extimo penultimi ad basin inserto; rami submembranacei punctis pellucidis ornati.

Trophi (unico exemplo) invisi.

Elytra basi constricta, apice clavata.

Postscutellum valde productum, linguiforme, crassum, superne basi profunde sulcatum.

Alæ amplæ; costâ inspissatâ; neurâ postcostali abbreviatâ; vittâ callosâ apicali [*seu neura prima insulata*], aliisque neuris majusculis quinque [*cum postcostali sex*]; quarum *secunda* [*insulata*] sicut ramus a tertiâ [*externo-mediâ*] excisus; hâc apicem versus subinterruptâ, cui radius brevis externe adjicitur: [reliquis neuris *areæ intermediæ inferioris* e basi radiantibus, quarum ultima analis].

Abdomen breve constrictum.

Coxæ [*trochanteres*] anticæ elongatæ.

Femora subbrevia.

Tibiæ breves compressæ.

Tarsi triarticulati; antici duo articulo basali robusto; secundo elongato, tenui; tertio parvo, obovato; postici duo articulis subæqualibus.

Species unica. *Halictophagus Curtisii*, Dale.

Curtis, "Brit. Entomology" (Dale), *loc. cit.*

Fuliginosus, subsericeus; antennis pedibusque luteis; alis vix obscure tinctis, iridescentibus, neuris brunneis; tarsorum articulorum abdominisque apice ochraceo.

Habitat Angliam, cum Halictis æratis maribus, mensis Augusti medio, circum carduos graminaque, prope mare sitû "Lulworth Cove" (Com. Dorsetiæ) dicto, rete verrente semel lectus; alterius quoque pupa (scil. femina?) ab Halicti corpore projecta simul detecta. (Dale, *loc. cit.*)

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Genus 2. Stylops, Kirby.

Kirby, Monogr. Apum. Angl. Tom. I. p. 257, Tab. XIV. fig. 11, 1802; Tom. II. pp. 110-114. Sowerby, Br. Misc. pars 9, Tom. I. pp. 93-5, Tab. XLV. Kirby, Trans. Linn. Soc. Lond., Tom. XI. p. 112, 1813.

(*Descriptio Kirbiana*, 1813.)

Antennæ bipartitæ, [sexarticulatæ,] ramis compressis, superiori articulato; stipite biarticulato; articulo primo sequente longiori, clavato vel obconico; apice oblique truncato; secundo brevissimo, cylindrico, ramos duos emittente: inferiori [articulo 3tio] paulo breviori, lanceolato et fere auriformi, compresso, exarticulato, supra concavo; superiori compresso, triarticulato: articulo primo [4to] longiori, sublineari, extrorsum paulo latiori; secundo [5to] brevi, tertio [6to] brevissimo, apice rotundato, linearibus, tenuioribus.

Oculi pedunculati, hexagonis numerosis.

Mandibulæ apice paulo crassiores.

Palpi articulo primo magno, obconico, compresso; secundo semi-ovato, acuto; subtus concavo.

Labrum, vel processus labri loco, porrectum, acutum.

Nasus obtusus, ante antennas prominens et labrum obumbrans.

Scutellum [*præscutum*, Aud.] apice obtusum.

Interlumbium [*scutum*, Aud.] posticè valde convexum.

Postlumbium [*scutellum*, Aud.] fere verticale, corneum.

Pedes trochanteribus posticis elongatis; tarsis [4-articulatis] articulo extimo fisso.

[*Alæ*, *costâ* basi inspissatâ, seu cum neurâ *mediastinâ* quasi conjunctâ; *postcostali* abbreviatâ; *areâ* costali obscurâ: *neurâ externo-mediâ* sinuatâ; *secundâ insulatâ* de margine externo ad illam basin versus vix attingente; *primâ insulatâ* (*apicali*) duplicatâ abbreviatâ: *area intermedia inferior* neurâ *subexterno-mediâ* gracili; aliisque tribus rectis, basi robustioribus, subappropinquatis, ad marginem exteriorem productis; scilicet *interno-media*, *subinterno-media*, et *analis*.]

Species 1. *Stylops Melittæ*, Kirby.

Monogr. Apum Angl., *loc. cit.*, Kirby & Spence, Introd. to Entomology, Tom. I. Tab. 2, fig. 1, 1828.

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Syn. *S. Kirbii*, Leach, Zoolog. Misc. Tom. III. p. 135, Tab. 149, 1814. *S. Haworthi*, Steph., Syst. Catal. 1829.

(*Kirbii descriptio*, 1802.)

St. aterrima; alis corpore majoribus; pedibus fuscis.

Long. corp. lin. 1½.

Corpus aterrimum, obscurum. *Caput* antice obsolete trilobum. (*Palporum* et *Antennarum*, vide antè descriptiones emendatas.)

Oculi magni prominuli, conspicue reticulati, pedunculo brevi, crasso, insidentes. *Vertex* planiusculus.

Truncus. Elytra parva, sublinearia, *thoracis lateribus affixa.* Alæ magnæ, corpore longiores, plicatæ, lacteæ, costâ lineolâque submarginali, nigricantibus. [*Pro-*] *Scutellum* [*postscutellum*, Aud.] porrectum, elongatum, calceiforme, abdomen obtegens; processu corneo utrinque munitum. *Pedes* compressi picei. *Abdomen*, sub scutelli tegmine delitescens, carnosum, ano truncato, subemarginato.

Larva [sc. fœmina]. Corpus subcylindricum, molle, albidum, in abdomine *Melittæ* capite exserto corneo, cordato, planiusculo, subrufo, postice nigro; subtus postice concavo.

In Mus. Brit. Oxon. et aliis.

Habitat Europam; typus in *Melittâ* (Andrenâ Fabr.) *nigro-æneâ*, K., incola. Species aliæ tamen putativæ, sive ob nuperrimam metamorphosin seu vetustatis vel ambiguitatis causâ, tantum dubiæ resultant, ut Dom. Smithii hypothesis *Stylopes* indigenas adhuc descriptas unicam constituere speciem (*s*) verisimillima videtur.

Nihilominus quales ab altoribus diversis oriundæ, quamvis species equivocæ sint, cum nominibus distinctis indicativis haud inutile conservari puto.

Species 2. *Stylops Dalii*, Curtis.

Curtis, "Brit. Entomology," Tom. III. Fol. et Tab. 226, 1828.

(*s*) Trans. Ent. Soc. Lond., ser. 2a, Tom. IV. p. 118.

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(*E descriptione Curtisianâ anglicè editâ.*)

Fuliginosa, scutelli basi, abdominisque lateribus ochraceis; alis postice emarginatis, angulo anali angustioribus, lacteis, iridescentibus; costâ, neurarum basi, elytris, pedibusque fuscis.

In Mus. Brit.

Habitat Angliam, ex *Andrenis labiali*, K., et *barbilabri*, K. a Domo. Daleo mense Maio dempta. Alia quoque sole fulgente volans capta.

Species 3. *Stylops Childreni*, Gray.

Griffith, Cuv. Regn. Anim. Tom. XV. Tab. 59 (Insecta Tom. II. p. 683 bis, 1832). Smith, Trans. Ent. Soc. Lond., ser. 2a, Tom. IV. Tab. XXIV. fig. D.

Fuliginosa, antennis palpisque piceis; abdomine luteopiceo; pedibus rufescentibus; alis pallide fuscis, iridescentibus, margine antico obscuriore.

Observatio. Ab aliis differt articulo basali apice rotundato, quartoque (seu rami secundi articulo basali) valde incrassato.

In Mus. Brit. typus.

Habitat Novam Scotiam; altore verisimiliter Andrenâ victimâ Smithii, cujus tria exempla ejusdem patriæ ita molestata annotantur (*t*); necnon Andrenâ placidâ Smithii, cujus exemplum, Stylope femininâ aggressum, simul in rete cum mare emancipato, a Dom. Packardo die ultimâ Aprilis Americâ septentrionali captum (*u*).

Species 4. *Stylops Spencii*, Pickering.

Trans. Ent. Soc. Lond., ser. 1a, Tom. I. p. 163, Tab. XVII. fig. 1-14, 1835. Westwood, Introd. Tom. I. Tab. I. fig. 6.

Ab aliis differt magnitudine majore; alis obscuris, neuris nigris; antennarum articulo basali interne ultra secundi basin oblique valde producto; alis antice acuminatis, latissimis, postice rotundatis; ano rufo-piceo.

(*t*) Smith in Trans. Ent. Soc. Lond., ser. 2a, Tom. V. p. 129.

(*u*) A. S. Packard, M. D. "Guide to the study of Insects," p. 483. Salemæ (Com. Massachusetts) Americæ, 1870.

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Habitat Angliam, cum *Andrenâ tibiali*, K. die Christi natali in latebrâ arenariâ situ Chiswick, prope Londinum, a Domo. Pickering fodiendo, mas alatus in pupario altore detectus.

Species 5. *Stylops aterrima*, Newport.

Trans. Linn. Soc. Lond., Tom. XX. p. 340, Tab. XIV. fig. 33, 1847.

Syn. *S. Trimmerana* (*Melittæ?*) Smith, Trans. Ent. Soc. Lond., ser. 2a, Tom. IV. p. 118, Tab. XXIV. fig. 6.

S. Melittæ simillima, sed capitis margine occipitali profunde exciso; antennis, capite, thorace, (alis?) pedibus, abdomineque aterrimis.

Habitat Angliam, cum *Andrenâ Trimmeranâ*, K., mensibus Aprilis et Maii imagines declaratæ.

Genus 3. Hylecthrus, Saund.

Trans. Ent. Soc. Lond., ser. 2a, Tom. I. p. 57.

Caput magnum transversum. *Oculi* ingentes. *Antennæ* 5-articulatæ; articulo basali brevi; secundo parvo truncato; tertio longissimo, spatulato, totâ fere latitudine subæquali, quartumque basin versus latere externo ferente; hoc parvo annuloso; extimo (5to) tertio simillimo et in illum recumbente. *Palpi* parvi, biarticulati; articulo basali crassiore, apice obliquo; apicali graciliore, setoso, compresso, externe recurvo. *Mandibulæ* elongatæ, compressæ, ensiformes. *Thorax* antice constrictus, disco gibboso, capiti latitudine subæquali; postscutello maximo, elongato-triangulari, margine antico sinuato, lateribus rectis, angulo postico subacuto porrecto. *Elytra* parva, apice valde dilatata, crassiora, subconcava. *Alæ* costæ dimidio basali inspissato (seu potius costâ cum neurâ mediastinâ, quasi conjuncta); *postcostali* ultra medium alæ evanescente, cum *externo-media* prope basin furcatâ; hâc subrectâ, deflexâ, ad marginem exteriorem vix attingente; prope apicem alæ neura incrassata *duplex* subabbreviata (*prima insulata*) exstat; *secunda insulata duplex*, tenuissima, elongata, de margine externo sinuate producta, retro ad neuram externo-mediam proxime extendit: *area intermedia inferior* neuris rectis, deflexis; quarum prima (subexterno-media) gracilis, ad marginem exteriorem attingens; duæ subapproximatæ (interno-

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media et subinterno-media) margini interno propiores, basi robustiores; alia quoque (analis) gracilis. *Abdomen* constrictum. Pedes longitudine mediocres, posteriorum tibiis apice dilatatis, compressis, genubus constrictis; tarsi 4-articulati, articulo apicali integro. *Mas.*

Fœmina, cephalothoracis aditu apicali cum processu palpiformi, minimo, utrinque munito (*x*).

Puparium, operculo oculorum situ pellucido, lævigato.

Species 1. *Hylecthrus rubi*, Saund.

Trans. Ent. Soc. Lond., ser. 2a, Tom. I. p. 17, Tab. VIII. fig. 1, a-k, mas; fig. 2, a-i, fœmina; fig. 3, larva primitiva; *ibid*, ser. 2a, Tom. II. Tab. XVI. figs. 2-10, mas; figs. 11-17, fœmina.

Niger, gibbosus, pedibus luteis; alis lacteis, neuris saturate piceis.

Varietas. (*H. pustulatus*, mihi.) Abdominis segmento singulo (apicali excluso) maculis binis luteis rotundis, superficie dorsali ventralique (cunctis viginti octo), signato.

Long. corp. $\frac{1}{2}$-$\frac{5}{6}$ lin.

Expans. alar. fere $1\frac{1}{2}$ lin.

Fœminæ nuper declaratæ cephalothorace pallido, lineolâ marginali tenuissimâ nigricante; vittâ utrinque, maculis duabus parvis transversis prope basin, angulisque posticis brunneis: parturientes disco convexiore fere omnino flavescente, vittâ mediâ longitudinali dilutiore.

In Mus. Brit. et nostro.

Habitat Epirum cum Prosope rubicolâ, rubis exsiccatis; a mense Junio ineunte usque ad medium ejusdem mensis, mares declarati; fœminæ parturientes sæpe Junio exeunte super porris floriferis cum altoribus lectæ.

Species 2. *Hylecthrus quercûs*, Saund.

Trans. Ent. Soc. Lond., ser. 2a, Tom. I. p. 18; *idem*, Tom. II. Tab. XVI. fig. 18.

(*x*) Trans. Ent. Soc. Lond., ser. 2a, Tom. I. Tab. VIII. fig. 2, a, b, c, d; *idem*, Tom. II. Tab. XVI. figs. 15, 16, 17, 20.

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A. præcedente differt magnitudine duplo majore, alis parum obscurioribus, neurisque magis nigricantibus. *Mas.*

In Mus. nostro.

Habitat Epirum, cum Prosope gibbâ, in quercûs gallis primo vere a Cynipibus relictis sæpe ædificante; mense Maio ineunte mares declarati; Junio ineunte fœminæ parturientes super hippomarathro florifero cum altoribus lectæ.

Species 3. *Hylecthrus Sieboldii*, Saund.

Trans. Ent. Soc. Lond., ser. 2a, Tom. II. p. 142, Tab. XVI. figs. 19, 20, femina.

Fœmina tantum, marisque exuviæ adhuc visæ; cephalothorace vittâ longitudinali, apice dilatatâ, fulvâ; fasciâque transversâ basali, medio interruptâ, piceâ.

In Mus. nostro.

Habitat Epirum cum Prosope variegatâ, Fabr., nunquam in rubis vel gallis ædificante; fœminæ parturientes cum altoribus in sabuletis juxta mentham sylvestrem mense Junio ineunte repertæ.

Genus 4. Elenchus, Curtis.

"British Entomology," Fol. et Tab. 385, 1831.

Antennæ elongatæ, tenues, 5-articulatæ, articulo tertio in ramum elongatum linearem, flexuosum, producto; reliquis duobus linearibus elongatis, ramum secundum constituentibus.

(*E descriptione Curtisianâ anglicé editâ.*)

Antennæ in acetabulo frontis utrinque positæ, tenues, pubescentes, scabrosæ, thorace longiores, ramis duobus elongatis, compressis; 5-articulatæ; articulis 1a et 2a brevibus, cyathiformibus; 3o lateraliter producto, elongato, lanceolato; 4o tenui, sequentis longitudine dimidio minore; 5o tertii ultra apicem producto.

Maxillæ [mandibulæ] elongatæ, tenues, lanceolatæ, corneæ.

Caput breve, antice lateribusque lobatum.

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Oculi [subsessiles] remoti, globosi hexagonis fere viginti.

Prothorax brevis.

Mesothorax longior; elytris clavatis, basi tenuibus, elongatis.

Metathorax magnus, oblongus, diagonaliter quadripartitus.

Postscutellum elongo-ovatum.

Alæ amplæ; costâ inspissatâ; neuris nonnullis imperfectis instructis, [scilicet postcostali robustâ; externo-mediâ abbreviatâ; neurâ insulatâ discoidali callosâ, nec margini exteriori propinquâ neque ad neuram externo-mediam productâ; neurâ insulatâ apicali (nisi discum luce penetrante) inconspicuâ vel obsoletâ; neurâ subexterno-mediâ item vix distinguendâ; aliisque neuris tribus posticis e basi radiantibus,] quarum ultima elongata ad marginem internum parallela (?).

Abdomen tenue, incurvum.

Pedes elongati, incurvi; postici remoti.

Coxæ [trochanteres] anticæ et intermediæ longissimæ; posticæ breves.

Femora tibiæque longitudine fere coæquales; harum anteriores 4 elongatæ, tenuæ, incurvæ; posticæ breves, apice dilatatæ.

Tarsi bi-articulati, antici 2 tenuiores; articulo basali subtus lobato, supra concavo ad secundum recipiendum; hoc subclavato.

Species 1. *Elenchus tenuicornis*, Kirb.

Syn. *Stylops tenuicornis*, Kirb.

Trans. Linn. Soc. Lond., Tom. XI. p. 233, 1811.

(*Descriptio Kirbiana ab exemplo mutilato.*)

Aterrimus, oculis subsessilibus, antennis tenuioribus piceis, ramis linearibus; alis nigricantibus.

Long. corp. ½ lin. circiter.

In Mus. Brit.

Habitat Angliam: imprimis a Domo. Sowerby Julio ineunte (1811) in Araneæ telâ lectus (*y*); postea a Domo.

(*y*) Kirby, *loc. cit.*

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Stephens prope Hertfordiam, æstate fortuite gramina verrente (*z*).

Altores adhuc ignoti.

Species 2. *Elenchus Walkeri*, Curtis, *op. cit.*

(An species distincta?)

E descriptione Curtisianâ anglice editâ.

Obscure luteus, oculis nigris, lucentibus; alis pallide fuscis, iridescentibus; neuris obscuris, pedibus antennisque pubescentibus.

Habitat Angliam et Hiberniam.

Altores ignoti.

In Angliâ a Dom. Walker graminibus situ Southgate, die 24 Junii captus (*a*): a Domo. Dale quoque inter flores triticumque rete verrente, situ Glanvilles Wootton (Com. Dorsetiæ) die 11 Junii (*b*); in Hiberniâ prope Belfast a Domo. Haliday mensibus Junio Julioque (*c*); a Domo. Templeton quoque eodem fere situ mense Augusto ineunte, in rete inventus quo prius Bombi nidus positus fuerat (*d*).

Species 3. *Elenchus Templetonii*, Westw.

Trans. Ent. Soc. Lond., ser. 1, Tom. I. p. 173, Tab. XVII. fig. 15.

(*Descriptio Westwoodiana.*)

Minimus; fuscus, thorace valde globoso, oculis magnis nigris, segmentis abdominalibus constrictis, antennarum articulo 5to subclavato et in medio subangustato, articulum referente; elytris clavatis versus apicem nigricantibus; alis latissimis pallidis fuscentibus, nervis obscurioribus; tarsis ut in *El. Walkeri*, Curt. formatis; pedibus antennisque pube tenuissimâ indutis.

(*z*) Trans. Ent. Soc. Lond., Tom. I. (Acta) p. lxv.

(*a*) Curtis, *loc. cit.*

(*b*) Curtis, *loc. cit.*

(*c*) Curtis, *loc. cit.*

(*d*) Curtis, *loc. cit.*; Westwood, Introd. Tom. II. p. 304, Trans. Ent. Soc. Lond., ser. 1a, Tom. I. p. 173.

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Long. corp. $\frac{3}{8}$ lin.; expans. alarum fere lin. 1.

In Mus. Oxoniæ, olim Prof. Westwoodii.

Habitat Insulam S. Mauricii; mense Augusto graminibus nemorum sub tegmine umbrantium, plurimi capti. Altores ignoti (*vide* ante p. 24, note *a*).

Sub-fam. 2. MYRMECOLACIDES.

(*Character essentialis.*)

Formicidarum, Linn. incolæ.

Adhuc Genus unum, species unica.

Genus 5. Myrmecolax, Westwood.

Trans. Ent. Soc. Lond., ser. 2a, Tom. V. p. 418, Tab. I. fig. 1-13; Idem, ser. 3a, Tom. I. (Acta) p. 23.

(*E Westwoodii descriptione anglice editâ.*)

Oculi ingentes, hexagonis paucis magnis, interstitiis conice elevatis.

Caput columnis oculiferis subovatis conspicuis utrinque munitum.

Antennæ pseudo-Elenchomorphæ, ramis duobus elongatis valde inæqualibus; stipite biarticulato; articulo basali brevi, secundo minori; tertio in tenuem ramum inferiorem lateraliter producto; quarto minimo vel ambiguo, e basi præcedentis emergente; reliquis ramum superiorem triarticulatum constituentibus, articulis subelongatis apice dilatatis, curvatis.

Mandibulæ longæ, tenues, incurvæ, apice acutæ.

Palpi articulo primo minimo; secundo elongato, compresso, externe curvato.

Prothorax brevis annularis; *mesothorax* consimilis, elytra clavata halteriformia ferens.

[*Alæ*, neurâ *mediastinâ* cum costâ quasi contiguâ; *postcostali* robustâ; *externo-mediâ* tenui; neurâ *primâ insulatâ* (*apicali*) ambiguâ, vel potius, ut videtur, cum *secundâ insulatâ* (*discoidali*) medio in unâ robustâ, apice utrinque recurvâ, conjunctâ. Areæ intermediæ inferioris neuris omnibus normalibus quatuor.]

Pedes brevissimi.

Tarsi articulis quatuor.

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Species 1. *Myrmecolax Nietneri*, Westw.

Magnitudine inter *Stylopes* et *Elenchum tenuicornem* intermedia; alarum neuris robustis atris.

In Mus. Oxoniæ, olim Prof. Westwoodii.

Habitat Insulam Taprobanen, e formicâ operariâ montanâ mense Aprili exeunte emergens lectus. Hæ formicæ magnitudine mediocres, saturate piceæ, cum paucis sodalibus sub tegmine petrorum vel lignorum jacentium nidificant; quarum fœminarum expansio alarum $\frac{5}{6}$ unciæ.

Sub-fam. 3. XENIDES.

(*Character essentialis.*)

Vespidarum socialium incolæ.

Stylopidæ hujus subfamiliæ ob altorum transformationes consociatas, *rapidam educationem perficiunt*, quia e larvis nutritoriis ejusdem anni imagines declarantur. Ita per tot menses ab anno præcedente usque ad æstatem ineuntem sequentem, cum fœminis hibernantibus proles retardatur; postea triginta fere dierum spatio, (sicut Polistium Vesparumque transformationes exigunt (*e*), larvæ internæ, vermiformes (exuviis primitivis olim dejectis), inter abdominis segmenta, capite protruso, in pupas mutantur.

Hæ larvæ primitivæ ad illas Polistium, ab ovo in cellulis nuperrime exclusas, ore caudâque quocunque situ fortiter adhærentes, mox introitum operantes, septimo vel octavo die immobiliter, capite recumbente, brevi spatio constrictæ restant; tunc gradatim tegumento dejecto in larvas albas apodas secundarias convertuntur (*f*).

Annotatio. Ex hâc subfamiliâ et sequente, ob paucitatem specierum quarum characteres adhuc cognoscuntur, plurimi alumni occultantur quos sub ipso typo generico inter se concordare haud recte assumendum est. Hâc causâ, dum imprimis secundum altorum affinitates distribuuntur, quibus consociationes reciprocæ indicuntur et conservantur, tenebras penetrare novaque discrimina cernere, aliis indagatoribus in futuro curæ sit.

(*e*) Ab ovo usque ad pupam dies 20–21. Pupæ 8-9. (Reaumurius de Poliste Gallico, Tom. VI. Mem. 6. p. 191.) "Ab ovo posito ad larvæ exclusionem dierum numerus incertus. Temperie moderata dies octo aut novem sufficiunt. Anno 1811, die 20 Maii, in cellulis primum octo larvæ prodiere. Die 6 Junii in puppam ibant." (Vespæ Gallicæ Historia, Polistes, Latr., Auctore Stephano Disderi in Mem. R. Acad. Taurini, Tom. XXII. 1816.)

(*f*) Trans. Ent. Soc. Lond., ser. 2a, Tom. II. p. 127.

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XENIDUM TABULA SYNOPTICA.

Genus 6. XENOS, Rossi.

SPECIES.	SEXUS.	AUTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *X. Rossii*, Kirby.....	♂ ♀	*Polistes*, Latr. ..... (*Gallicus*, Linn.)	Europa	Tr. Linn. Soc. Lond., Tom. XI. p. 116, 1813.
Syn. *X. vesparum*, Rossi...	.....	.....	.....	Fauna, Etrus. Mant. App. Tom. II. p. 114, 1794.
Varietas, *X. Jurinei* mihi..	.....	.....	.....	Mem. R. A. Taurino, *loc. cit.*
2. *X. Peckii*, Kirby	♂	*P. fuscatus*, Fab.....	America Borealis ...	Trans. Linn. Soc. Lond., *ut supra.*
——————?	♂ exuv.	*P. Americanus*, Fab.....	,,	Smith, Tr. E. S. Lond., Tom. V. ser. 2a, p. 131.
——————?	♂ exuv. et ♀	*P. instabilis*, Sauss.....	Brasilia	Smith, *ibidem.*
——————?	♀	*P. Hebræus*, Fab.....	India orientalis ..	Horne, Tr. Zool. Soc. Lond., Tom. VII. p. 171.
——————?	♀	*P. stigma*, Fab.....	,,	*Ibidem.*
3. N.S....	♂	*P.*	Caffraria.....	In Mus. Oxon. *
——————?	♀	*Icaria*, Sauss..... (*ferruginea*, Fab.)	India orientalis...	Horne, *ubi supra.*
——————?	♀	*Polybia*, Sauss..... (*sericea*, Oliv.)	Brasilia	Smith, *ubi supra.*
——————?	♀	*Belonogaster*, Sauss..... (*junceus*, Fab.)	Tripolis	*Ibidem.*
——————?	2 ♂ exuv. et ♀	*B. rufipennis*, De Geer.....	Africa.....	In Mus. Dom. Smithii.
——————?	♀	*B. griseus*, Fab.	,,	*Ibidem.*
——————?	♂ exuv.	*Vespa*, Linn..... (*concolor*, Kirby.)	*Ubi* (?).	Kirby, Tr. Linn. Soc. Lond., Tom. XI. pp. 90, 118.
——————?	♀	*V. vulgaris*, L. (?).....	Germania ...	Van Rozer, in Trans. Ent. Soc. Lond. Tom. 1, ser. 1a; Proc. p. lxxiv.

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* *Vide* p. 36.

[Tot decursis annis nisi e Polistibus duobus gallico et fuscato jamdudum indicatis, *Xenum* marem ex aliis Vespidis educantibus nusquam invenisse, mirabile dictu. Nunc tamen ab alio Poliste nova Xeni species adjicitur, dum reliquarum Vespidarum socialium alumni omnino occultantur.]

Genus 6. Xenos, Rossi.

Rossi, Faun. Etrus, Mant. App. p. 114, 1794. Kirby, Trans. Linn. Soc. Lond., Tom. XI. p. 113, 1813.

(*Descriptio Kirbiana.*)

Mandibulæ, subflexuosæ, medio crassiores, acutæ.

Palpi articulo primo compresso flexuoso; secundo ovato acuto.

Antennæ bipartitæ [4 articulatæ], ramis semiteretibus, exarticulatis, symmetricis; stipite biarticulato; (*g*) articulis brevissimis; primo sequente paulo longiori, fere obconico, apice oblique truncato; ultimo [2do] ramos duos [art. 3 et 4] semiteretes, superficie interiori plano, exteriori convexo, a basi ad apicem magnitudine sensim decrescentes, symmetricos, emittente.

Oculi hexagonis paucis, vix ultra 50; septis crassis elevatis.

Scutellum [*præscutum*, Aud.] apice subemarginatum.

Postlumbium [*scutellum*, Aud.] declive membranaceum.

Femoralia supra anticè concava.

Pedes coxis anticis brevissimis, reniformibus, trochanteribus posticis coxis vix longioribus; femoribus posticis intus obtusangulis; tarsis [*quadri-articulatis*] articulo extimo integro.

Abdomen corneum, proscutello [*postscutello*, Aud.] longius, vix retractile, segmentis octo: podice minuto lineari adunco supra terminatum, subtus stylo longiusculo lineari reflexo; basi dilatato; apice, ut videtur, fisso (?), ano carnoso.

[*Alæ costâ* cum neurâ mediastinâ proximis; *postcostali* valde abbreviatâ; *areâ costali* nebulosâ, latere interno

(*g*) Stipite triarticulato secundum Kirbium, quia articulum distinctum pro basi tertii, ut videtur, existimavit. (*loc. cit.*, pp. 114, 121, Tab. IX. fig. 10b).

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apicem versus vix circumcinctâ; *neurâ externo-mediâ* sinuatâ, integrâ, ad marginem exteriorem fere attingente: *area intermedia superior* neuris insulatis simplicibus elongatis duabus, de margine exteriore ultra medium alæ retro productis, *apicali* paulum breviore, *discoidali* ad neuram externo-mediam basi plus minusve appropinquante: *area intermedia inferior* neurâ tenuissimâ rectâ (*subexterno-mediâ*) imprimis munita, aliisque tribus magis conspicuis, rectis, subappropinquatis, basi inspissatis, ad marginem exteriorem productis; quarum ultima analis.]

Puparium, oculorum operculis fenestratis; fenestrulis hexagonis. (Kirby, *l. c.*, p. 115, Tab. VIII. fig. 5a, 7 a a.)

Species 1. *Xenos Rossii*, Kirb.

Syn. *X. vesparum*, Rossi. (*h*)

Rossi, Fauna Etrus. *loc. cit.*, Tab. VII. fig. B. Jurine, Mem. R. Acad. Sc. Taurini, Tom. XXIII. p. 50, Tab. LXIII. 1818. Idem, Isis, 1832, Tab. XIII. fig. 13. Siebold, Wiegm. Archiv. Berolini, 1843; Tab. VII. (Larva, pupa, femina.) Trans. Ent. Soc. Lond., ser. 2, Tom. II. Tab. XV. fig. 1-8; Tab. XVI. fig. 1.

(*Descriptio Rossiana.*)

Totus ater, fuliginosus. *Caput* parvum. *Oculi* valde prominuli, sphærici, manifeste compositi. *Labium* breve, medio setigerum. *Palpi* duo filiformes longiusculi, articulis duobus inæqualibus, primo brevi rotundo, altero elongato, compresso. *Antennæ* breves, vix capite longiores, duplici ramo instructæ, ramis æqualibus, deflexis, compressis, quasi ensiformibus. *Thorax* lobo antico in collum veluti protractus, et singulariter utrinque ad basin appendiculatus, membranulâ, seu pedunculo instar halterum porrecto, cochleariformi [elytris]; in medio latior, convexus, inæqualis, posticeque admodum elongatus. *Abdomen* fere cylindricum, neque petiolatum neque aculeatum. *Femora tibiæque* posticæ depressæ et breviores. *Tarsi* [articulis] quatuor, fusci, subtus albidi.

(*h*) Nominis antici mutationem justificat Kirbius, ob hujus et aliarum specierum ejusdem generis originem communem. (Trans. Linn. Soc., *loc. cit.*, p. 116.)

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Alæ albæ, longitudine abdominis.

Varietas. (*X. Jurinei*, mihi.) Abdominis segmentis singulis (basali et apicali? exclusis) maculas binas luteas superne exhibentibus. (Jurine, ubi supra.)

Habitat Europam; larva in Poliste gallico alita.

Species 2. *Xenos Peckii*, Kirb.

Trans. Linn. Soc. Lond., *loc. cit.*, Tab. 8, 9.

(*Descriptio Kirbiana.*)

Nigro-fuscus; antennis ramis semiteretibus dilutioribus, albo-punctatis, ano pallido, pedibus luridis; tarsis fuscis.

Corpus nigro-fuscum, ex pube brevissimâ et nisi sub lente forti omnino inconspicuâ opacum et quasi velutinum.

Caput inter antennas longitudinaliter elevatum et fere carinatum. *Palpi* articulo primo secundo longiori. *Antennæ* capite longiores, ramis majis dilute fuscis, subdiaphanis, punctis minutissimis albis.

Truncus. *Thorax* postice in medio obtusangulus. *Scutellum* [*præscutum*, Aud.] longitudinaliter et late canaliculatum. *Postlumbium* pallidum. *Alæ* cinereo-albidæ; margine crassiori, nervisque nigris. *Pedes* cinerei, vel potius luridi, tarsis nigricantibus.

Abdomen reliquo corpore magis obscurum; ano pallide rufescente.

Long. corp. 1½ lin.

Habitat. Larva in *Poliste fuscato*, Fabr., Americæ septentrionalis.

Species 3. *Xenos* ——.

In Mus. Oxoniæ, a Prof. Westwoodio cito describendus. (*Vide* Xenidum, Tab. Synopt. Annot., p. 36).

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Sub-fam. 4. PSEUDOXENIDES.

(*Character essentialis.*)

Vespidarum solitarium et Hymenopterorum Fossorium incolæ.

A præcedentibus maxime dissidentes Pseudoxenides apud altorum larvas in cellulis clausis *diu perstant*, annoque sequente maribus fœminisque declaratis, larvæ primitivæ pariuntur, incunabulisque novis altorum nidificantium transferuntur.

Quamvis in seipsis Fossores a Vespidis solitariis perspicue discrepant, moribus quoad tempus in quo alterutrorum proles de anno in annum educantur et declarantur plus minusve concordant.

Alumnorum tamen plurimi, ut a reliquiis detectis constat, hodie occultantur. Quare specierum adhuc cognitarum characterum integrorum expositione, ab aliis scriptoribus per specificos sæpe definitorum (comparationis in præsenti unicus modus facilis et opportunus), mihi discriminare visum est. De aliis tamen per orbem dispersis, altorum omnino divergentium, ut ab marium exuviis, fœminarumve tegumentis derelictis, in tabulâ sequente exhibetur, nondum opinari datum est.

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PSEUDOXENIDUM TABULA SYNOPTICA.

Genus 7. PSEUDOXENOS.

SPECIES.	SEXUS.	ALTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *P. Schaumii*, n. s.	♂	*Odynerus*, Latr. (*parietum*, Linn.)	Corcyra	In Mus. nostro.
		Syn. *Vespa 6-fasciata*, Ros.		Rossi, Fauna Etrus. Mant. App. p. 116.
		Vespa aucta, Fab.		Saussure Vesp. Sol. Tom. I. p. 130.
2. *P. Heydenii*, Saund.	♂ ♀	*O. deflendus*, Saund.	Epirus et Corcyra	Trans. Ent. Soc. Lond., ser. 2a, Tom. II. p. 141.
		Syn. *O. viduus*, (?) Schæff.		Kirchner Catal. Hymenop. Eur. Vindob. 1867.
3. *P. Klugii*, Saund.	♂	*Epipone*, Kirb. (*lævipes*, Shuck.)	Epirus	Trans. Ent. Soc. Lond., ser. 2a, Tom. II. p. 141; Tab. XV. fig. 9–15.

Genus 8. PARAXENOS.

SPECIES.	SEXUS.	ALTORES.	PATRIA.	BIBLIOGRAPHIA.
1. *P. Erberi*, n. s.	♂ ♀	*Bembecinus*, Costa (*Larra*) *peregrinus*, Sm. Var. *bituberculatus*, Forst	Corcyra	In Mus. nostro.
2. *P. Corcyricus*, n. s.	3 ♂	*Epipone spinipes*, L.	Corcyra	In Mus. nostro.
3. *P. Sieboldii*	♀	*Ammophila sabulosa*, L.	Gallia	Dufour; Ann. Sc. Nat. 1837, ser. 2a, Tom. VII.
Syn. *X. Sphecidarum*, Sieb.	♂ ♀	Idem, et *Miscus campestris*, Latr.	Germania	Siebold; N. Schrift. d. Nat. Gesch. Danz. 111, 2, 1839, p. 172.
4. *P. Westwoodii*, Templ.	♂	*Sphex*, Fab. (*aurocapilla*, Templ.)	Brasilia	Trans. Ent. Soc. Lond., ser. 1a, Tom. III. p. 51.

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PSEUDOXENIDUM SPECIES OCCULTÆ.

1. A Vespidis solitariis educatæ.

ALTORUM.		ALUMNI IGNOTI.	PATRIA.	BIBLIOGRAPHIA.
GENUS.	SPECIES.			
Paragia, Shuck	*decipiens*, Shuck	♂ exuv.	Australia	Smith, Tr. Ent. Soc. Lond., ser. 2a, Tom. V (Acta) p. lxxxviii.
"	*tricolor*, Smith	♀	"	In Mus. Dom. Smithii.
Psiliglossa, mihi *	*Odyneroides*, Saund.	♂ immat.	Epirus	In Mus. nostro.
Eumenes, Latr.	*petiolata*, Fab.	♂ exuv. et ♀	India	Smith, Tr. Ent. Soc. Lond., ser. 2a, Tom. V. p. 130.
"	*pomiformis*, Rossi	♂ pupa	Nicæa	In Mus. Oxon.
Rhynchium, Sauss.	*flavomarginatum*, Sm.	2 ♀	China	Smith, Tr. Ent. Soc. Lond., ser. 2a, Tom. I, p. 72.
Odynerus, Latr.	——?	♂ exuv.	Brasilia (Ega)	Smith, Tr. Ent. Soc. Lond., ser. 2a, Tom. V. p. 130.

* Pro *Raphiglossæ* Sectione B, in Trans. Ent. Soc. Lond., ser. 2a, Tom. I. p. 72; cui nomen *Stenoglossa* a Dom. Saussurio in Vespidarum solitarium egregiâ Monographiâ (Tom. I. p. 4) anno 1852 dedicatum fuit. Hoc nomen tamen a Barone Chaudoireo in 1848 ad Coleopterorum Genus prius in Bull. Soc. Nat. Mosc. (I. p. 117) appropriatum fuit; igitur in Vespidis a nomine Psiliglossa substitui.

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2. Ab Hymenopteris Fossoribus educatæ.

ALTORUM.		ALUMNI IGNOTI.	PATRIA.	BIBLIOGRAPHIA.
GENUS.	SPECIES.			
Ammophila, Kirb.	*holosericea*, Fab.	2 ♂ exuv. et 2 ♀	Sicilia	Smith, Tr. Ent. Soc. Lond., ser. 2a, Tom. V. p. 129.
,,	*capensis*, St. Farg.	♂ exuv.	Tunetum	*Ibidem.*
,,	*ferrugineipes*, St. Farg.	♂ exuv.	Gambia	*Ibidem.*
,,	*atripes*, Smith	♀	India	In Mus. Brit.
,,	——— sp. (?).			In Mus. Oxon.
Sphex, Fab.	*petiolata*, Smith	♀	Brasilia	Smith, *ubi supra.*
,,	*flavipes*, Smith	♂ exuv.	Georgia	*Ibidem.*
,,	*tibialis*, Fab.	♂ exuv.	America borealis	In Mus. W. W. Saundersii.
,,	——— n. s.	♂ exuv. et ♀		In Mus. Dom. Smithii.
Parasphex, Sm.	*albisecta*, St. Farg.	♀	Epirus	In Mus. Brit. (ab auct. lecta).
,,	*fervens*, Fab.	♀	India	*Ibidem.*
Pelopœus, Latr.	*Chiliensis*, Spin.	♂ exuv.	Chile	Smith, *ubi supra.*
,,	*laboriosus*, Smith	2 ♀	Insula Aru	*Ibidem.*
,,	*deformis*, Smith	♀	Shanghai	*Ibidem.*
,,	*intrudens*, Smith	♀	Celebes	*Ibid*, p. 133.
,,	*fasciatus*, St. Farg.	♂ exuv.	Chile	In Mus. Dom. Smithii.
,,	*flavo-fasciatus*, Sm.	♂ exuv.	Celebes	*Ibidem.*

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Genus 7. Pseudoxenos.

(*Characteres e P. Schaumii desumpti.*)

Palpi articulo basali brevi, robusto, secundo elongato, subcylindrico, hirto, deflexo.

Mandibulæ elongatæ, ensiformes.

Antennæ 4-articulatæ; articulo *basali* brevi, apice dilatato, angulo interno porrecto; *secundo* transversali, minimo; *tertio* in ramum internum subrectum, compressum, uni formem, apice subobtusum, producto; *quarto* lamelliformi, simillimo, longitudine fere coæquali, ad basin præcedentis inserto, in illum recumbente, spatio libero vix basi relicto.

Alæ costæ dimidio basali inspissato; *neurâ postcostali* abbreviatâ; *areâ costali* latâ nebulosâ, ultra neuras productâ; *neurâ externo-mediâ* valde sinuatâ, ultra medium alæ tenuissimâ, ad marginem exteriorem vix attingente: *area* intermedia *superior* neurâ *primâ insulatâ* duplicatâ abbreviatâ; *secunda insulatâ* elongatâ, valde sinuatâ, simplice, de margine exteriori usque ad neuram externo-medium basin versus fere attingente: *area* intermedia *inferior* neurâ primâ (subexterno-mediâ) gracillimâ, aliisque tribus simplicibus, basi inspissatis, ultra medium tenuissimis; quarum ultima analis.

Pedes omnes elongati, graciles; trochanteres anteriores 4 femoribus fere coæquales; postici 2 breviores; tibiæ tenues, elongatæ, apice vix dilatatæ; tarsi nitidi, articulis apice angulis prominulis, basi tenuissimis; articulo primo paulo longiore, reliquis longitudine diminuentibus, apicali rotundato integro.

Puparium, operculo oculorum situ fenestrulis paucis minutissimis instructo.

Species 1. *Pseudoxenos Schaumii*, n. s.

Niger; antennis, palpis, elytris, pedibusque brunneis; abdomine flavescente, segmento singulo, basali excluso, (septem) disco dorsali ventralique vittâ transversali abbreviatâ brunneâ: processu anali piceo: alis hyalinis, neuris piceis; areâ costali opacâ. *Mas.*

Long. corp. $1\frac{3}{6}$ lin.

Habitat Insulam Corcyram, mense Octobri ineunte in pupario cum altore *Odynero parietum*, L. semel lectus; et Illustri nomini, nulli secundo, dicatus.

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Species 2. *Pseudoxenos Heydenii*, Saund.

Trans. Ent. Soc. Lond., ser. 2a, Tom. II. p. 141, Tab. XV. fig. 15-24.

Aterrimus; antennarum rami tuberculis minutis albis dense bullati; alis hyalinis neuris piceis, pedibus luteis. *Mas.*

Long. corp. 1 lin.

Habitat Epirum et Insulam Corcyram, Odyneri deflendi alumnus; a Julio ineunte usque ad Octobris idus, mares in pupariis cum altoribus lecti; fœminæ parturientes quoque diebus Julii decimo tertio, Augusti nono, et Octobris undecimo, cum eâdem Odyneri spicie prehensæ.

Species 3. *Pseudoxenos Klugii*, Saund.

Ibid., p. 142, Tab. XV. figs. 9-15.

Præcedente paulo major; antennis subtilioribus, pedibus pallidis.

Habitat Epirum, cum Odynero *lævipede*, Shuck. (i), in rubis exsiccatis, cellulas limosas construente, ex quibus imagines, cum alumnorum pupariis expositis, Maio mense exeunte evadunt.

Genus 8. Paraxenos.

Palpi articulo basali crasso, arcuato; secundo cylindrico, hirto, deflexo.

Mandibulæ basi latiores, interne fortiter emarginatæ.

Antennæ 4-articulatæ; articulo primo brevi, apice dilatato, angulo interno prominulo, tertii cubitum versus porrecto: *secundo* minimo, subcuneiformi, lateribus angulatis: *tertio* in ramum internum producto, basi externè dilatatum ad quartum recipiendum, deinde subito rectangulariter reflexo, reliquo compresso, distorto, basi tumido, apice subtiliore, obtuso: *quarto* e basi præcedentis retrorsum emergente, in illum inflexo, spatio libero intermedio basi relicto, similiter compresso, basi dilatato, apice subobtuso, longitudine præcedentem plus minusve excedente.

(i) *O. rubicola*, Dufour et Perris, Ann. Soc. Ent. Fr., Tom. IX. p. 23, 1840.

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Alæ costæ dimidio basali cum neurâ mediastinâ proximo sed distincto; *postcostali* remotâ subabbreviatâ; *areâ costali* latâ nebulosâ, ultra neuras productâ; neurâ externo-mediâ sinuatâ, dimidio apicali duplicatâ, tenuissimâ: *area intermedia superior* neuris insulatis binis duplicatis, de margine externo retro productis; quarum discoidales paulum longiores, a neurâ externo-mediâ longe abstantes: *area intermedia inferior* neuris rectis tenuibus; primâ (subexterno-mediâ) gracili; aliis e basi radiantibus, subapproximatis, tribus, basi paulum inspissatis, deinde quasi duplicatis, quarum ultima analis.

Pedes antici trochanteribus femoris tibiisque longitudine fere æqualibus; tarsorum articulis 4, fere similibus, basali robustiore, apicali tenuiore; *intermedii* fere consimiles; *postici* coxis reniformibus, trochanteribus subovatis, robustis; tibiis tenuioribus.

Puparium, operculo oculorum situ fenestrulis paucis minutissimis instructo.

Species 1. *Paraxenos Erberi*, n. s.

Elongatus, ater, pedibus fuscis, antennarum ramis longitudine fere cœæqualibus.

Long. corp. $\frac{5}{6}$ lin.

In Mus. nostro.

Habitat Insulam Corcyram; larva in Bembecino (Larra) peregrino Smithii (var. *B. bituberculato*, Forsteri) alita; mares in pupariis, fœminæque, cum altoribus prope latebras, in sabuletis, mense Maio exeunte crebro lecti; ubi a diligente Entomologo *J. Erbero* Vindobonensi (mihi sodale et amico cui species dicatur) imprimis detecti.

Species 2. *Paraxenos Corcyricus*, n. s.

A præcedente differt antennis brevioribus, ramis latioribus, pedibus cunctis longissimis, tenuibus, luteis.

Long. corp. $\frac{5}{6}$ lin.

Habitat Insulam Corcyram cum Odynero *spinipede*, L., cujus exemplar, marium puparia quatuor sub abdominis segmentis 2o, 3o, 4o, et 5o, superne alternatim dextrà sinistràque exhibens, in sabuletis die 16 Maii lectum; e quibus die 22 ejusdem mensis imagines tres obtinui.

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Species 3. *Paraxenos Sieboldii.*

Syn. *Xenos Sphecidarum*, Dufour, Ann. Sc. Nat. Parisiis: ser. 2, Tom. VII. p. 19, 1837 (fœmina). Siebold; N. Schrift. d. Naturforsch. Gesellsch. in Danz. 111-2, p. 72, 1839, Tab. III. fig. 68 (mas.), fig. 62, (fœmina) commus fig. 70 (larva primitiva).

(*E descriptione Sieboldianâ germanice editâ.*)

Fuliginosus; pedibus piceis; alis lacteis, margine antico brunneo; antennarum ramis lateraliter compressis, interno semper paulo longiore.

Long. corp. 1½ lin.

Expans. alar. 2 lin.

Primum cum *Ammophilâ sabulosâ*, L., a Dom. *L. Dufourio*, Galliâ meridionali, mense Augusto (1834) fœminæ binæ detectæ fuerunt.

Mox quoque cum *Ammophilâ* ipsâ et Misco campestri Latr. ab egregio Entomologo Dre. *C. T. Sieboldio* in Germaniâ, mares fœminæque cum prole, haud raro, a mense Junio usque ad æstatem exeuntem reperiebantur; maribus antennarum articuli furcati, ut in tabulâ *loc. cit.* delineantur, (*k*) cum typo generico veri *Paraxeni* concordantes.

Ob tamen originem communem cum plurimis aliis Sphecidarum incolis, hæc species (velut in *X. Vesparum* casu) distinctionis gratiâ in honorem Clar. Viri dicatur.

Species 4. *Paraxenos Westwoodii*, Templ.

Xenos Westwoodii, Templ. Trans. Ent. Soc. Lond., ser. 1a, Tom. III. p. 51, Tab. IV.

(*E descriptione Templetonianâ anglice editâ.*)

Antennæ subrobustæ, 4-articulatæ; articulo *basali* brevi, subcylindrico, basin versus subcontracto, apice

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(*k*) Antennarum stipes triarticulatus secundum descriptionem (*l. c.*, p. 79) vix abnormis opinor (*vide* p. 9, *ante*, Annotatio *g*).

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dilatato, interne porrecto, subtriangulari; *secundo* minimo, medio constricto, subtus quasi cyathiformi, ubi articulus tertius affixus; illis hirsutis, reliquis duobus tessellatis; *tertio* compresso, elongato, medio dilatato, apice rotundato; basi subito rectangulariter divertente, acetabulo basali ad quartum sustinendum; *quarto* retrorsum et supra partem prolongatam tertii recumbente, longitudine fere quartâ parte excedente, et similiter medio, basique postice paulum dilatato.

Mandibulæ elongatæ, angustæ, vix arcuatæ, apice valde acutæ, incurvæ.

Palpi (*tri-?*) [*bi-*] articulati; articulo basali (*minimo?; secundo?*) magno, tumido, paulo retrorsum curvato; apicali parvo, cylindrico, dense hirto.

Pedes antici tenues, breviores; coxis [trochanteribus?] brevibus, tumidis, curvatis; femoribus paulo longioribus, subtriangularibus; *tibiis* elongatis, clavatis; *tarsis* 4-articulatis, articulo basali longiore; reliquis longitudine diminuentibus, bilobatis, appendiculatis, subtus marginibusque hirsutis. Vesiculæ desunt.

Long. corp. $2\frac{3}{4}$ lin.

Habitat Brasiliam, cum Sphece aurocapillâ Templetoni.

Tot altoribus jam citatis quorum Stylopidarum alumni nondum deteguntur, aliisque adjiciendis, vasta regio exploranda manet, ubi plurima arcana elicienda occultantur.

Divisio B. HOMOPTEROBIÆ.

Sub-fam. 5. ———.

Insectum Homopteron, Fulgoridarum Familiæ, ex Archipelago Indico in Musæo Hopeiano Oxoniæ conservatum, Stylopidarum exuvias exhibens, a Professore Westwoodio annotatum, (*l*) cujus descriptionem fusiorem ab ipso Cel. Auctore mox exoptamus, citare opportet; quod interim in divisionem exclusivam collocamus.

(*l*) Trans. Ent. Soc. Lond., ser. 3a, Tom. V. (Acta) p. lxxxviii.

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II. *On certain species of* Pericopides *in the Collection of* Mr. W. Wilson Saunders: *with a List of the described species pertaining to that Group.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Read 1st January, 1872.]

Mr. Saunders having kindly allowed me to describe the new species of *Pericopides* in his Collection, I have taken this opportunity of correcting one or two errors to which Mr. Brown, his Curator, has called my attention.

Upon comparing the types of *P. bivittata* in the British Museum, and *P. disjuncta* in the Collection of Mr. Saunders, it was found that the two forms are specifically identical, the differences between them being merely individual in character.

The genus *Daritis* is identical with *Pericopis* in structure, and I think it quite likely that *D. marginalis* may prove to be the female of *P. dissimulans*.

My *P. lunifera* (type in Coll. Saunders) is *P. turbida*, of Hübner's *Zuträge;* the latter was placed amongst the varieties of the species in the National Collection, *P. Aglaura* and *P. tricolora* being considered as opposite sexes of the typical form.

The following are new species :—

Genus Esthema.

Esthema confluens (Felder, *in litt.*).

Alæ supra cœruleo-nigræ; anticæ fascia postmediana subhyalina alba, introrsum obliqua, extrorsum arcuata a venis nigris interrupta; posticæ areis basali et interna nitente virescentibus, fascia media lata, utrinque subito angustata, subhyalina, alba, a venis nigris interrupta: corpus nitide virescens, capite albo-punctato, antennis nigro-fuscis.

Alæ subtus nigrescentes, area basali viridi-striata: corpus griseum a latere virescens, thorace albo-punctato, abdomine albido annulato.

Hab.—Villa Nova.

Allied to *E. speciosa*.

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Genus Pericopis.

1. *Pericopis noctuites.*

Alæ anticæ supra subhyalinæ, fumato-fuscæ; macula discoidali rotundata nigro-fusca albido-cincta, altera disco-cellulari quadrata fusca; fascia interna cuneiformi nigro-fusca; area apicali et margine externo decrescente nigrescente, extrorsum et introrsum albicante: posticæ niveo-hyalinæ, margine externo et apice nigris; costa cinerea: corpus thorace piceo-fusca, collo albido, abdomine cinereo ad basin nigro-fasciolato, ano aurantiaco: alæ subtus albicantes, omnes macula basali coccinea, aliter velut supra: corporis abdomine albicante.

Hab.—Minas Geraes? (Rogers).

Allied to *P. parnassiodes*, Wlk.

2. *Pericopis rubripicta.*

Alæ supra fuscæ; anticæ vena costali, macula quadrata discoidali subterminali, striga mediana submediana a basi ad marginis externi medium currente in ramum primum medianum area cinerea interrupta, a margine ad venam costalem fascia obliqua subapicali currente, pallide sulphureis; venis nigris; basi flavescente; macula discoidali altera discocellulari et tertia subanali squamosis coccineis; posticæ basi albido rorata, macula bifida discoidali et altera trifida subapicali sulphureis; serie punctorum quatuor rubrorum apicalium oblique positorum et plaga magna quadrifida subanali cuneiformi roseo-rubra: corpus thorace fusco, collo tegulisque flavis; abdomine nigro a latere flavo sex-fasciolato, ano aurantiaco: alæ subtus fasciis maculisque distinctioribus, omnes macula basali coccinea: corpus nigro-fuscum, abdomine a latere maculis sex aureo-flavis, fasciolas terminantibus, ano aurantiaco.

Hab.—Bogota.

Belongs to the *sacrifica* group, and comes near *P. Woodii*, Butler.

3. *Pericopis fenestrata.*

♂ Affinis *P. Theti*, ♂ (*Daritis Thetis*, Wlk.), alis minoribus, anticis costa longiore margine externo magis

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obliquo, interno breviore; fasciis hyalinis multo latioribus; dimidio basali cellæ discoidalis hyalino; area externa pallidiore, punctis septem submarginalibus hyalinis; posticæ strigula discocellulari minus angulata; area externa aurantiaca angustiore introrsum vix nigro limitata: alæ subtus dilutiores.

Hab.—S. Geronimo, Vera Paz (Salvin).

A local form of the Mexican *P. Thetis.*

The *Pericopides*, according to the original arrangement in the second volume of Mr. Walker's 'Lepidoptera Heterocera,' were an ill-defined group, probably intended to extend from *Esthema* to the end of *Chrysauge;* but in the seventh volume, p. 1653, the limits of the group are defined, a family being formed under the title of *Pericopidæ*, for the reception of the following genera:—*Esthema, Heleona, Hyalurga, Cistidia, Dysphania, Pericopis, Phaloë, Phaloësia, Composia,* and *Eucyane;* Mr. Walker remarks that this family 'is connected with the *Melameridæ* by means of *Esthema* and *Eucyane*, and has some affinities with the *Arctiidæ;*' no structural characters are given.

As I do not consider the *Pericopides* to be sufficiently distinct from the *Arctiidæ* to form a separate family, I have hitherto referred them to that family in the vicinity of *Callimorpha.*

Excepting that I should add the two genera *Stenele* and *Hyelosia*, I at present see no objection to the adoption of Mr. Walker's 'Family' as a subgroup of the *Arctiidæ;* the order of affinity in the genera seems to be *Esthema, Eucyane, Composia, Phaloësia, Stenele, Hyalurga, Hyelosia, Phaloë, Pericopis:* I omit *Heleona, Cistidia,* and *Dysphania,* because I have not seen types of these groups, and inasmuch as they are Indo-Australian, whilst all the other genera are Tropical American, it is quite possible that they may prove to be more nearly allied to the *Lithosiidæ** than to the *Arctiidæ.* The whole of the American Genera are characterized by having the antennæ prominently pectinated in the males and nearly

* The *Pericopides* are placed in this family by Mr. Walker, to whom I am indebted for much information respecting the *Heterocera* generally.

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simple in the females, the palpi are of moderate length, the last joint being tolerably long and porrect. Dr. Felder remarks (Wien. Ent. Mon. VI.)—"Genera *Esthema, Eucyane, Anthomyza,* Phaloë, Phaloësia, Dioptis, Composia* et alia ad primi abdominalis annuli latera duo exhibent foramina, operculo globuliformi tecta."

I am acquainted with descriptions of the following species:—

Esthema, Hübner.†

1. *E. bicolora,* Cr. pl. 143, A.
   E. dichroa, Hübner, Samml. Ex. Schmett. 1, pl. 187.
   Hab.—Para. B. M.

2. *E. Aletta,* Cr. pl. 396, C.
   Hab.—Surinam.

3. *E. simulata,* Walk., Cat. Lep. Het. Suppl. p. 1872.
   E. mimica, Walk., *l. c.,* p. 1874.
   Hab.—Bogota. B. M.

4. *E. plagifera,* Feld., Wien. E. Mon. 6, p. 230.
   Hab.—Rio Negro.

5. *E. speciosa,* Walk., Cat. Lep. Het. Suppl. p. 1873.
   Hab.—Bogota. B. M.

6. *E. Herrona,* Butler, Ann. & Mag. Nat. Hist. Oct. 1871, p. 285.
   Hab.—Bogota. Coll. Saunders.

7. *E. euplœodes,* Butler, *loc. cit.*
   Hab.—Colombia. Coll. Saunders.

8. *E. uraneides,* Butler, *loc. cit.*
   Hab.—Cayenne. Coll. Saunders.

9. *E. confluens,* Butler, *ante* p. 49.
   Hab.—Villa Nova.

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* = *Pericopis.*

† Included two types, *E. dichroa* and *papilionaria;* the latter is now referred to the genus *Cycloria.*

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EUCYANE, Hübner.*

1. *E. Celadon*, Cr., pl. 132, E.
Hab.—Surinam.

2. *E. Pylotes*, Dr., Ill. Ex. Ent. 2, pl. 5, fig. 3.
Hab.—Mexico. B. M.

3. *E. glauca*, Cr., pl. 107, E.
Hab.—Para. B. M.

4. *E. amica*, Cr., pl. 370, H.
Hab.—Surinam, Cr. — ? (an sp. dist. ?) B. M.

5. *E. Militta*, Cr., pl. 370, I.
Hab.—Surinam.

6. *E. temperata*, Walker, Cat. Lep. Het. 7, p. 1656.
Hab.—Tapajos (Walk.); Ega. B. M.
The Upper Amazons form of *E. glauca*.

7. *E. uranicola*, Walk., Cat. Lep. Het. Suppl. p. 1875.
Hab.—Ega, Bogota. B. M.

8. *E. uranophila*, Walk., *loc. cit.*, p. 1874.
Hab.—St. Paulo, Peru. B. M.

9. *E. uranigera*, Walk., *loc. cit.*, p. 1876.
Hab.—St. Paulo. B. M.

10. *E. Hystaspes*, Butler, P.Z.S., Jan. 1871, p. 82.
Hab.—Venezuela. B. M.

11. *E. Melaxantha*, Hübner, Samml. Ex. Schmett. 1, pl. 188.
Hab.—Brazil. B. M.

COMPOSIA, Hübner. †

1. *C. Sybaris*, Cr., pl. 71, E.
Bombyx credula, Fabr., E. S. 3, 1, p. 475.
Hab.—Haiti; Jamaica. B. M.

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* The first and last species are congeneric.

† Type *C. credula*.

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PHALOESIA, Walker.*

1. *P. saucia*, Walk., Cat. Lep. Het. 2, p. 359.
Hab.—Venezuela; Nicaragua. B. M.

2. *P. Olympia*, Butler, Ann. & Mag. Nat. Hist., Oct. 1871. p. 290.
Hab.—Brazil. Coll. Saunders.

STENELE, Walker.†

1. *S. translata*, Walk., Cat. Lep. Het. 2, p. 356.
Hab.—Para; Tapajos. B. M.

HYALURGA, Hübner.‡

1. *H. fenestra*, Linn., M. L. U. p. 372; *Hyalurga fenestrigera*, Hübner, Verz. p. 174. *Sphinx* (*adscita*) *Egeon*, Cr., pl. 59, B.
Hab.—Venezuela. B. M.

2. *H. Uria*, Butler, Ann. & Mag. Nat. Hist., Oct. 1871, p. 286.
Hab.—Peruvian Amazons. Coll. Saunders.

3. *H. albovitrea*, Walk., Cat. Lep. Het. Suppl. 1, p. 159.
Hab.—Ega. B. M.

GYARA, Walker.§

1. *G. fenestrata*, Walk., Cat. Lep. Het. 4, p. 915.
Hab.—Para; Rio. B. M.

I doubt the propriety of separating this species from the genus *Hyalurga*, and therefore have not mentioned it in my list of genera, it is referred to the *Pericopides* in Mr. Walker's supplement.

HYELOSIA, Hübner.‖

1. *H. Tiresia*, Cr. 400, B ♂; 85, B ♀. *Hyelosia Clio*, Hübn., Verz. p. 174.
Hab.—Para. B. M.

I feel doubtful about the sexes on Cramer's plate being conspecific.

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* Type *P. saucia*.
† Type *S. translata*.
‡ Type *H. fenestrigera*=*fenestra*, L.
§ Type *G. fenestrata*.
‖ Type doubtful, but, restricted by Mr. Walker, it becomes *H. Tiresia*.

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2. *H. heliconides,* Swains., Zool. Ill. 2nd S. pl. 124, fig. 2.
Hab.—Brazil. B. M.

PHALOE, Guérin.

1. *P. cruenta,* Hübner, Samml. Ex. Schmett. Zutr. figs. 329, 330.
Hab.—Brazil. B. M.

The specimens mentioned by Mr. Walker from Venezuela are quite distinct.

PERICOPIS, Hübner.*

1. *P. catilina,* Cr., pl. 79, figs. E. F. *Phalæna catilinaria,* Fabr., Sp. Ins. p. 250. *P. Nasica,* Fabr., Ent. Syst. 3, p. 169. *Pericopis perspicua,* Walk., Cat. Lep. Het. 2, p. 344.
Hab.—Ega; Para. B. M.

2. *P. ignita,* Butler, Fabr., Cat. p. 291; Lep. Exot. pl. 17, fig. 3.
Hab.—Tapajos. B. M.

The two species above mentioned nearly resemble the species of *Hyelosia.*

3. *P. Isse,* Hübner, Samml. Ex. Schmett. 507.
Hab.—Ega. B. M.

4. *P. decisa,* Walk., Cat. Lep. Het. 2, p. 345.
Hab.—Bogota. B. M.

5. *P. angulosa,* Walk., *loc. cit.*
Hab.—Venezuela. B. M.

6. *P. Zerbina,* Stoll, Suppl. Cr., pl. 70, fig. 3.
Hab.—S. America. B. M.

7. *P. Eurocilia,* Cr., pl. 178, C.
Hab.—W. Indies.

8. *P. indecisa,* Walk., Cat. Lep. Het. 2, p. 347.
Hab.—Rio Janeiro. B. M.

9. *P. subguttata,* Walk., *loc. cit.*
Hab.—Rio Janeiro. B. M.

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* Four congeneric species as types.

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10. *P. bivittata*, Walk., *loc. cit.*, p. 348. *P. disjuncta*, Walk., *l. c.*, 7, p. 1655.
Hab.—Venezuela. B. M.

11. *P. humeralis*, Walk., *loc. cit.*
Hab.———? B. M.

12. *P. nubila*, Walk., *loc. cit.*, p. 349.
Hab.—Brazil. B. M.

13. *P. patula*, Walk., *loc. cit.*
Hab.—Bolivia. B. M.

14. *P. submarginata*, Walk., *loc. cit.*, p. 350.
Hab.—Brazil. B. M.

15. *P. parnassiodes*, Walk., *loc. cit.*
Hab.—Brazil. B. M.

16. *P. Aglaura*, Cr., pl. 263, F, ♂.
Hab.—Venezuela. B. M., ♂, ♀.

17. *P. Jansonis*, Butler, Lep. Ex. pl. 17, figs. 4, 5.
Hab.—Nicaragua. B. M., ♀.

18. *P. turbida*, Hübn., Samml. Ex. Schm. Zutr. figs. 529, 30. *P. lunifera*, Butler, Ann. & Mag. Nat. Hist. 1871, p. 288.
Hab.—Bahia. B. M., ♀.

19. *P. tricolora*, Cr., pl. 263, E.
Hab.—Para; Brazil. B. M., ♂, ♀.

20. *P. leucophæa*, Walk., Cat. Lep. Het. 2, p. 352.
Hab.—Mexico. B. M.

21. *P. rosina*, Butler, P.Z.S. p. 82 (1871); Lep. Ex. pl. 30, fig. 1.
Hab.—Ega. B. M.

22. *P. subapicalis*, Walk., Cat. Lep. Het. 2, p. 352.
Hab.—Brazil. B. M.

23. *P. larvata*, Walk., *loc. cit.*, 7, p. 1654.
Hab.—Amazons Valley. Coll. Saunders.

24. *P. rorata*, Walk., Cat. Lep. Het. Suppl. 1, p. 154.
Hab.—Bogota. Coll. Birchall.
Seems to come near *P. parnassiodes*.

25. *P. dissimulata*, Walk., *loc. cit.*, p. 155.
Hab.—Bogota. B. M.

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26. *P. dissimulans,* Walk., *loc. cit.*
Hab.—Bogota. B. M.

27. *P. Arema,* Boisd., Lep. Guat. p. 85 (*Thebrone*).
Hab.—Nicaragua; Venezuela.
Evidently allied to the preceding species.

28. *P. rubrimargo,* Boisd., Lep. Guat. p. 89 (*Thebr.*).
Hab.—Honduras and Mexico.
Evidently near *P. leucophœa.*

29. *P. salvatoria,* Boisd., Lep. Guat. p. 86 (*Aphisaon*).
Hab.—Honduras and Guatemala.
Also near *P. leucophœa.*

30. *P. sacrifica,* Hübn., Ex. Schmett. Zutr. 473, 4 ♀.
Hab.—Ipaunema. Coll. Saunders.
The male is smaller than the female, and has the bands of front-wings and the whole of hind-wings, except the margin, hyaline-white.

31. *P. Woodii,* Butler, Ann. and Mag. Nat. Hist. 3rd S., Vol. 20, p. 218, pl. 4, figs. 2, 3 (*Mazœras Woodii*).
Hab.—Bahia. Coll. Wood.

32. *P. Thetis,* Klug, Neuere Schmett. 6, 4, figs. 1, 2.
Hab.—Mexico. B. M.

33. *P. marginalis,* Walker, Cat. Lep. Het. 3, p. 618.
Hab.—Venezuela. B. M.
Possibly ♀ of *P. dissimulans,* mentioned above.

34. *P. Hydra,* Butler, Ann. & Mag. Nat. Hist. Oct. 1871, p. 286.
Hab.—Ecuador. Coll. Saunders.

35. *P. Ithrana,* Butler, *loc. cit.*
Hab.—Amazons. Coll. Saunders.

36. *P. Kenara,* Butler, *loc. cit.*, p. 287.
Hab.—Sta Martha. Coll. Saunders.

37. *P. fulgorata,* Butler, *loc. cit.*
Hab.—Para. Coll. Saunders.

38. *P. Hazara,* Butler, *loc. cit.*
Hab.—Villa Nova and Ecuador. Coll. Saunders.

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39. *P. formosissima*, Butler, *loc. cit.*, p. 288.
Hab.—Colombia and Ecuador. Coll. Saunders.

40. *P. Thyridina*, Butler, *loc. cit.*, p. 289.
Hab.—Ecuador. Coll. Saunders.

41. *P. vestalis*, Butler, *loc. cit.*
Hab.—Brazil. Coll. Saunders.

42. *P. Holofernes*, Butler, *loc. cit.*
Hab.—Minas Geraes. Coll. Saunders.

43. *P. Irenides*, Butler, Cist. Ent. 4, p. 88.
Hab.—Cartago, Costa Rica. Coll. Janson.

44. *P. Leonina*, Butler, *loc. cit.*, p. 89.
Hab.—Cartago, Costa Rica. Coll. Janson.

45. *P. noctuites*, Butler, *ante* p. 50.
Hab.—Minas Geraes (?). Coll. Saunders.

46. *P. rubripicta*, Butler, *l. c.*
Hab.—Bogota. Coll. Saunders.

47. *P. fenestrata*, Butler, *l. c.*
Hab.—S. Geronimo. Coll. Saunders.

I have indicated the following species in the 'Annals' for October, 1871, and unless the 4th Part of the Lepidoptera of the 'Novara Voyage' appear beforehand, I shall figure them with the other species which I have described.

48. *P. Salvini* (Felder, MS.) Butl., Ann. & Mag. Nat. Hist., Oct. 1871, p. 290.
Hab.—Polochic Valley. Coll. Saunders.

49. *P. mimica* (Felder, MS.), Butl., *loc. cit.*
Hab.—Upper Orinoco. Coll. Saunders.

50. *P. Histrio* (Felder, MS.) Butl., *loc. cit.*
Hab.—Villa Nova, Coll. Saunders; St. Paulo, B. M.

In the above List, I have not attempted any arrangement according to affinities, but to the best of my belief, I have not overlooked anything; however, without going carefully through the whole of the Macro-Lepidoptera, it would be impossible to be certain that species so subject to mimetic modification as the *Pericopides*, have not here and there been misplaced, and thus passed by.

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III. *Descriptions of some Species of* Cassididæ *new to science.* By J. S. Baly, F.L.S.

[Read 4th March, 1872.]

The insects described in the present paper have been (with only two exceptions) collected by Mr. Buckley, during his recent expeditions to Ecuador; many of the species, although differing sufficiently in structural characters, and in several instances, belonging to distinct genera, show a remarkable similarity in their markings and coloration, being another instance of the well-known fact, that insects coming from the same locality often follow, to a certain extent, a common pattern in the arrangement of the colour on the surface of the bodies.

There are yet some other species collected by Mr. Buckley, not here described, remaining in my collection; these I hope to make the subject of a future paper.

List of Species.

Dolichotoma instabilis,		Ecuador.	*Mesomphalia perjucunda*,		Ecuador.
,,	*sericea*,	,,	,,	*emorsitans*,	,,
Calaspidea contacta,		,,	,,	*latissima*,	,,
Mesomphalia deliciosa,		,,	,,	*consociata*,	Bolivia.
,,	*pauperula*,	,,	,,	*pœcilaspoides*,	Ecuad.
,,	*Buckleyi*,	,,	*Omaspides*	*bivittata*,	,,
,,	*pectinata*,	,,	,,	*abbreviata*,	,,
,,	*Pascoei*,	,,	*Batonota*	*distincta*,	,,
,,	*interjecta*,	,,	,,	*Jansoni*,	Chontales.

Dolichotoma instabilis.

Rotundata, postice paullo attenuata, convexa, cuprea aut nigro-ænea, antennis nigris; dorso subnitido, pube cinereâ adsperso; thorace longitudine duplo latiori, lateribus ab apice ad basin oblique ampliatis, angulis posticis lateraliter productis, acutis; supra fere impunctato, utrinque irregulariter excavato, medio longitudinaliter canaliculato; elytris thorace duplo latioribus, lateribus basi late rotundato-ampliatis, ante medium ad apicem angustato-rotundatis, prope apicem citius angustatis, apice conjunctim late rotundatis; dorso convexis, basi retusis, deinde transversim gibbosis, irregulariter

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elevato-reticulatis, reticulo nitido, areolas parvas irregulare opacas includenti; margine laterali antice late, postice modice, explanato, fere plano, vittâ latâ, superficiem fere amplectente, supra disci marginem extensâ, rufo-testaceâ, ornato. *Mas.*

Triangularis, elytrorum lateribus basi oblique ampliatis, paullo ante medium obtuse angulatis, hinc ad apicem rotundato-angustatis, apice subacute rotundatis. *Fœm.*

Var. *a.* Elytrorum margine laterali disco concolori, sanguineo vel testaceo-reticulato.

Var. *b.* Elytris totis unicoloribus.

Long. 7-8 lin.

Hab.—Ecuador.

D. instabilis is very variable both in colour and shape; some males being less rotundate, and some specimens of the other sex more triangular than the rest; it may be separated from *D. Salvinii, metallica* and all the other species to which it is most closely allied, by having the whole of its upper surface sparingly clothed with short pubescence.

Dolichotoma sericea.

Rotundata, modice convexa, nigro-ænea, subopaca, antennis, basi exceptis, nigris, subtus magis nitida; femoribus antice antennarumque basi pallide testaceis; thorace longitudine plus duplo latiori, apice utrinque sinuato, medio leviter producto, lateribus ante medium late rotundato-ampliatis, pone medium fere rectis, parallelis; disco medio convexo, pube adpressâ argenteo-cinereâ dense vestito, margine laterali lineâque longitudinali centrali, postice tenuiter canaliculatâ, glabris; elytris pube adpressa cinereâ brevissimâ vestitis, thorace latioribus, lateribus a basi ad medium late rotundato-ampliatis, ultra medium ad apicem rotundato-angustatis, apice conjunctim late rotundatis; supra modice convexis, basi leviter impressis, ante medium obsolete gibbosis, fortiter punctatis, punctis prope suturam subseriatim dispositis; margine laterali late explanato, remote punctato.

Long. 7½ lin.

Hab.—Ecuador.

Dolichotoma sericea is similar in form to *D. speciosa*, the latter species may, however, be at once known by the

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glabrous surface of the body, and by the entirely different coloration; both species agree in the almost entire absence of the gibbosity of the elytra; in the present insect, however, it is slightly more distinct than in *D. speciosa.* Five lower joints of antennæ, together with the base of the sixth, pale testaceous, stained at their apices with piceous. *M. puberula,* Boh., and *Batonota distincta,* mihi, the latter described below, both strongly resemble *D. sericea* in pubescence and colour.

Calaspidea contacta.

Subrotundata, postice modice attenuata, convexa, glabra, obscure nigro-ænea, subnitida, subtus nitida, antennis nigris, gracilibus; thorace longitudine duplo latiori, lateribus pone apicem fere ad basin oblique ampliatis, basi rotundatis; dorso utrinque concavo, impunctato; elytris thorace multo latioribus, humeris leviter sed distincte antrorsum prominulis, apice rotundatis; lateribus pone humeros fere ad medium rotundato-ampliatis, hinc ad apicem rotundato-angustatis, apice conjunctim rotundatis; disco convexis, a basin ultra medium perparum elevatis, hinc ad apicem declivibus, elevato-reticulatis, reticulo nitido, punctato, areolas sat magnas opacas includenti; margine laterali late explanato, leviter deflexo, confertim sed tenuiter punctato, vittâ fulvâ plus minusve erosâ vel interruptâ, rufo-tinctâ, plerumque piceo-maculatâ, fere a basi ad apicem extensâ, ornato.

Long. 8⅔ lin.

Hab.—Ecuador.

This beautiful species so closely resembles *Mesomphalia Pascoei,* that at first sight I placed it in my cabinet in the immediate neighbourhood of that insect; on examination however, for the purpose of description, I found that it belonged to the present genus; it possesses the narrow thorax of *A. alurna* and *Columbiana,* the slender antennæ of *C. discors, regalis,* and their allies, and the convexity of *C. divalis* and *Colossa;* it is easily separated from any of these insects by one or other of the above-named structural characters, and also by the peculiar pattern of its elytra.

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Calaspidea Colossa, Boh.

Mon. Cass. Suppl. p. 93.

Var. *b*. Elytrorum vitta intramarginali obsoleta, margine prope apicem maculis parvis sanguineis notato.

Hab.—Ecuador.

Mesomphalia deliciosa.

Late subtriangularis, apice acuminata; convexa, dorso gibboso, nigro-æenea aut nigra, subopaca, glabra, subtus nitida, antennis nigris; thorace longitudine duplo latiori, lateribus pone apicem oblique ampliatis, vix pone medium rectis, parallelis; disco opaco, utrinque concavo; elytris thorace multo latioribus, humeris antrorsum paullo prominulis, apice rotundatis; lateribus pone humeros fere ad medium ampliato-rotundatis, hinc ad apicem oblique rotundato-angustatis, apice conjunctim acuminatis; disco convexis, basi retusis, obtuse gibbosis, distincte sed leviter punctatis, subopacis, obsolete elevato-reticulatis; margine laterali antice late, postice modice, explanato, paullo deflexo, subcrebre punctato, margine externo anguste reflexo, plagâ oblongâ, postice attenuatâ, a paullo infra basin ad longe pone medium extensâ rufo aut fulvo-testaceâ, ornato.

Var. *a*. Elytrorum plagis intramarginalibus obsoletis, margine prope medium parce sanguineo-reticulatis.

Long. 6-7 lin.

Hab.—Ecuador.

This striking insect is nearly allied to *M. textilis*, Guér., but it is broader in proportion to its length, while at the same time the apices of the elytra are more acute; the sides of the thorax are also less oblique; it differs besides entirely in colour and pattern.

Mesomphalia pauperula.

Late subtriangularis, convexa, dorso gibbosa, obscure nigro-æenea, subopaca, subtus nitida, antennis nigris; his basi femorumque facie antica pallide piceis; thorace longitudine duplo latiori, lateribus pone apicem ad paullo ultra medium oblique ampliatis, deinde ad basin fere rectis; disco pube argenteo-sericeâ brevissimâ sparse

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vestito, utrinque concavo, intra marginem lineâ obliquâ impresso, lateribus late reflexis; medio convexo, punctis magnis 4, quadratim dispositis, profunde impresso; elytris thorace multo latioribus, humeris antrorsum vix prominulis, apice rotundatis, lateribus infra humeros fere ad medium ampliato-rotundatis, a medio ad apicem oblique rotundato-angustatis, apice conjunctim acutis; supra pube brevissimâ sparse vestitis, disco convexis, basi retusis, obtuse gibbosis, fortiter punctatis, punctis magnis, interstitiis elevatis, reticulas irregulares formantibus; margine laterali late explanato, fortiter, minus crebre punctato, vittâ latâ a paullo infra basin fere ad apicem extensâ, superficiem fere amplectante, fulvo-testaceâ, postice infuscatâ, ornato.

Long. 6 lin.

Hab.—Ecuador.

At first sight, the single specimen from which I have drawn up the above description, looks like a starved individual of the former species, but in addition to the more oblique sides of the thorax, and the peculiar sculpturing of its disc, the broader form, the less acuminate apex, and the deeper punctation of the elytra, will easily separate it from that insect.

Mesomphalia Buckleyi.

Late ovata, postice attenuata, modice convexa, nigro-æenea, antennis nigris; supra subnitida, pube adpressâ griseâ vestitâ; subtus nitida; thorace longitudine plus duplo latiori, obscure æneo, subtiliter punctato, lateribus apice truncatis, transversim productis, hinc ad medium oblique ampliatis, deinde subito rotundatis, pone medium ad basin fere rectis, parellelis; elytris thorace latioribus, basi rotundato-ampliatis, humeris obsoletis; latioribus ante medium ad apicem rotundato-angustatis, apice rotundatis; disco convexis, ante medium citius elevatis, irregulariter elevato-reticulatis, reticulo nitido, areolas sat magnas punctatas includenti; margine laterali late explanato, ♂ fere horizontali, ♀ magis deflexo, crebre punctato, vittâ fusco-flavâ, utrinque irregulariter et profunde erosâ, interdum interruptâ, a basi ad apicem extensâ, ornato.

Long. 9-11 lines.

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Hab.—Ecuador.

Thorax more than twice as broad as long; sides truncate at the apex, then subobliquely enlarged to the middle, straight and parallel from behind the latter to the apex; disc slightly concave on either side, transversely convex in the middle, impressed in the medial line with a faint longitudinal groove; surface subnitidous, very finely and subremotely punctured, very sparingly clothed with short adpressed sericeous hairs; elytra twice as broad at their widest part as the thorax, shoulders broadly ampliate-rotundate, the humeral angles entirely obsolete; sides rounded and narrowed from the middle to the apex, the latter conjointly rounded; upper surface of disc convex, the highest portion of the convexity, especially in the ♂, being before the middle; surface covered with raised, shining, impunctate reticulations, which enclose irregular, opaque, punctured areolæ, these spaces are frequently covered with small reticulations, which render the large ones less defined.

Mesomphalia pectinata.

Rotundata ♂, postice attenuata ♀, modice convexa, nigro-ænea, subopaca, pube adpressâ griseâ sparse vestita, subtus nitida, antennis nigris; thorace longitudine duplo latiori ♀, paullo latiori ♂, lateribus ab apice ad longe pone medium oblique ampliatis, basi ipso subrectis, disco pube adpressâ vestito; elytris thorace latioribus, humeris late rotundato-ampliatis, angulis obsoletis; lateribus a medio ad apicem angustato-rotundatis (postice magis angustatis ♀), disco modice convexis, elevato-reticulatis, reticulo subnitido, areolas magnas, opacas, obsolete punctatas includenti; margine laterali late explanato, crebre sed tenuiter punctato, vix obliquo, vittâ submarginali, fere a basi ad apicem extensâ, intus ramulos nonnulles (circa 5) ad disci marginem emittente, pallide flavo-fulvâ, ornato.

Long. 9-10 lin.

Hab.—Ecuador.

A broader and shorter insect than *M. Buckleyi*, less convex, sides of the thorax much more obliquely dilated, more coarsely pubescent; the reticulations on the disc of the elytra are also larger, and enclose opaque, nearly impunctate areolæ; the pattern on the lateral margin is

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also entirely different: in *M. Buckleyi** the fulvous vitta is placed on the inner portion of the margin, extending for a short distance over the disc; both its edges are irregular, but it is far more deeply notched on its outer side. In *M. pectinata*, on the other hand, the stripe is placed near the outer edge of the lateral margin, its outer border is entire, and it emits from its inner edge a number of short transverse fasciæ, which extend inwards as far as the margin of the disc.

Mesomphalia Pascoei.

Rotundata, postice paullo attenuata, modice convexa, obscure nigro-ænea aut nigra, subopaca, pube sericeâ vestita, subtus magis nitida, antennis nigris; thorace longitudine fere duplo latiori, lateribus pone apicem oblique ampliatis, deinde rotundatis, pone medium rectis, paullo divaricatis; disco lævi, medio convexo, tenuiter longitudinaliter canaliculato, utrinque concavo, lateribus late reflexis, pube depressâ argenteo-sericeâ minus dense vestito; elytris thorace multo latioribus, humeris non prominulis ♂; leviter antrorsum productis ♀; apice rotundatis; lateribus pone humeros fere ad medium rotundato-ampliatis, pone medium ad apicem rotundato-angustatis, apice conjunctim subacute rotundatis aut rotundatis; disco modice convexis, basi citius elevatis, pube suberectâ adspersis, elevato-reticulatis, reticulo nitido, hic illic fortiter punctato, disco exteriori sæpe obsoleto, areolas sat parvas irregulares opacas includente; margine laterali late explanato, vix deflexo ♂; magis deflexo ante medium ♀; subcrebre punctato, vittâ submarginali angustâ, pallide fulvâ, intus ramulos nonnullos irregulares, sæpe interruptos, nonnihil obsoletos emittante, ornato.

Long. 8-9 lin.

Hab.—Ecuador.

This species is very similar in pattern to *M. pectinata;* it is at once known by the narrow thorax, the distinct humeral angles of the elytra, the coarse pubescence,

* The vitta in the ♂ and ♀ of this species covers a larger portion of the surface, and extends much closer to the border of the elytra; but its outer margin is even more deeply notched than in the other sex.

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and lastly, by the greater irregularity of the short fasciæ which arise from the inner border of the lateral vitta; these are often interrupted and sometimes entirely obsolete, the vitta itself occasionally being itself reduced to a narrow submarginal line; in some specimens the fulvous markings are more or less stained with piceous.

Mesomphalia interjecta.

Subtriangularis, convexa, obscure nigro-ænea, subnitida, pube brevi adpressâ cinereâ sparsissime vestita, subtus nitida, antennis nigris; thorace longitudine plus duplo latiori, lateribus pone apicem fere ad medium late explanatis, leviter rotundatis, deinde cite rotundatis, pone medium ad basin rectis, fere parallelis; dorso tenuiter subremote punctato, utrinque irregulariter sed leviter foveolato, medio ante basin transversim excavato; elytris thorace multo latioribus; lateribus a basi fere ad medium rotundato-ampliatis, hinc ad apicem angustatis et leviter rotundatis, apice conjunctim rotundatis; disco convexis, pone basin citius elevatis, distincte subcrebre punctatis, irregulariter elevato-reticulatis, reticulo nitido, disco exteriori prope marginem obsoleto, areolas sat magnas opacas includente, margine laterali ante medium late, pone medium modice explanato, subfortiter punctato, obscure fusco-æneo, plagis irregularibus 6, prope disci marginem positis, disco ipso paullo incurrentibus, vittam interruptam formantibus, sordide fulvis, ornato.

Long. 9 lin.

Hab.—Ecuador.

The triangular form of this insect (which is very similar to that of *M. elocata*, Boh.) will at once separate it from any of the species characterized in the present paper.

Mesomphalia perjucunda.

Rotundata, leviter convexa, obscure nigro-ænea, subnitida, pube cinereâ vestita, subtus nitida, antennis nigris; thorace longitudine fere duplo latiori, lateribus ante medium oblique rotundato-ampliatis, deinde citius rotundatis, hinc ad basin rectis; dorso medio convexo, utrinque

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concavo, lateribus late reflexis; disco impunctato, sparsissime cinereo-sericeo; elytris thorace fere triplo latioribus, humeris vix prominulis, apice rotundatis, lateribus pone humeros fere ad medium leviter rotundato-ampliatis, hinc ad apicem citius rotundato-angustatis, apice conjunctim rotundatis; disco leviter, ante medium citius convexis, irregulariter elevato-reticulatis, reticulo nitido, areolas sat magnas, disco externo vagas, opacas, punctatas includente; margine laterali late explanato, plano, fulvo, limbo, lineisque transversis 5, a margine externo ad discum extensis, obscure nigro-æneis.

Long. 7-8 lin.

Hab.—Ecuador.

The singularity of the markings on the elytra will at once separate the beautiful insect from any hitherto described species. The marginal bands radiate from within outwards, and would (if produced inwardly) meet nearly in the centre of the suture; they are frequently dilated, leaving only six narrow fulvous lines.

Mesomphalia emorsitans.

Anguste ovata, postice valde attenuata, convexa, obscure nigro-ænea, subnitida, pube adpressâ sericeâ sparse vestita; subtus magis nitida, antennis nigris; thorace longitudine duplo latiori, lateribus ante medium oblique ampliatis, deinde rotundatis, hinc ad basin rectis, parallelis; disco foveolato, impunctato, sparsissime cinereo sericeo; elytris thorace multo latioribus, humeris antrorsum leviter prominulis, apice rotundatis, lateribus pone humeros fere ad medium ampliato-rotundatis, hinc ad apicem rotundato-angustatis, apice conjunctim subacutis; supra (præsertim ante medium) convexis, basi obsolete retusis, crebre et fortiter punctatis, disco ante medium reticulato-rugosis; margine laterali modice ampliato, vittâ submarginali, postice angustatâ, intus bis-emarginatâ, vix infra basin ad apicem extensâ, pallide fulvâ, ornato.

Long. 8½ lin.

Hab.—Ecuador.

Very similar in form and sculpture both of thorax and elytra to *M. blandifica*, Boh., the elytra rather more convex, less produced at the apex, and the shoulders rather less distinct; although so differently coloured, it is not unlikely to prove a variety of that species.

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Mesomphalia latissima.

Rotundata, longitudine distincte latior, modice convexa, obscure nigro-æenea, subopaca, subtus magis nitida, antennis nigris; thorace longitudine fere duplo latiori, apice distincte emarginato, lateribus pone apicem fere ad medium oblique rotundato-ampliatis, deinde rotundatis, pone medium ad basin rectis, parallelis; dorso medio convexo, longitudinaliter canaliculato, utrinque concavo, lateribus late reflexis; disco dense argenteo-sericeo, lineis duabus, unâ longitudinali, alterâ transversâ, disci medio positis, crucis figuram formantibus glabris; elytris longitudine distincte latioribus, basi truncatis, fere transversis, humeris late rotundatis, non prominulis, lateribus pone humeros rotundatis, pone medium ad apicem angustato-rotundatis, apice late rotundatis; disco modice convexis, pone basin citius elevatis, pube adpressâ cinereâ sparsissime vestitis; subcrebre sed tenuiter punctatis, interstitiis lævibus, prope suturam obsolete elevato-reticulatis; margine laterali latissimo, fere plano, obsolete transversim strigoso, plagâ magnâ a basi ad longe ultra medium productâ, postice attenuatâ, ante apicem desinente, rufo-testaceâ, ornato.

Long. 8½, lat. 9 lin.

Hab.—Ecuador.

Very closely allied to *M. latevittata*, Boh., and possibly only a variety of that species; differing principally in its transverse form, and in the absence of the reticulations, which in the former insect are spread over the disc of the elytra; the nigro-æneous edge of the lateral margin of the elytron is also broader, and the rufo-testaceous vitta terminates much sooner.

Mesomphalia consociata.

Late rotundato-ovata, postice attenuata, leviter convexa, nigro-æenea, subnitida, pube subdepressâ cinereâ sparse vestita, antennis nigris; thorace longitudine plus duplo latiori, lateribus pone apicem ad longe ultra medium oblique ampliatis, hinc ad basin rectis; dorso opaco, pube sericeâ depressâ sparsissime adsperso, medio convexo, utrinque concavo et ibi unifoveolato, lateribus late reflexis; elytris thorace multo latioribus, a basi fere ad medium rotundato-ampliatis, hinc ad apicem rotundato-

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angustatis; dorso leviter convexis, basi citius elevatis; elevato-reticulatis, reticulo nitido, sat elevato, areolas magnas opacas includente; margine laterali late explanato, leviter deflexo, confertim punctato, vittâ latâ fere a basi ad apicem extensâ, superficiem fere amplectente, ornato.

Long. 10½ lin.

Hab.—Bolivia.

This species stands very near to *M. Saundersi*, Boh.; it is rather narrower, and more shining above; the reticulations on the elytra are stronger and more distinctly raised from the surface of the disc; the dark nigro-æneous border of the dilated margin of each elytron is also much broader.

Mesomphalia pœcilaspoides.

Ovato-subrotundata, postice paullo angustata, convexa, subnitida, subtus nitida, obscure nigro-ænea, antennis nigris; thorace longitudine duplo latiori, apice leviter emarginato, lateribus pone apicem oblique ampliatis, vix pone medium ad basin leviter rotundatis, parellelis, angulis posticis subrectis, obtusis; dorso medio convexo nitido, hic illic leviter excavato, tenuiter et remote punctato, utrinque concavo, lateribus late reflexis, crebre rugoso strigosis; elytris testaceis thorace multo latioribus, humeris antrorsum vix prominulis, apice rotundatis; lateribus pone humeros fere ad medium leviter ampliato-rotundatis, hinc ad apicem rotundato-angustatis, apice conjunctim subacute rotundatis; supra, convexis, basi citius elevatis et ibi leviter excavatis, crebre et fortiter punctatis, vittâ suturali infra basin paullo dilatatâ, et utrinque maculis tribus disco positis nigris; margine laterali late explanato, paullo deflexo, limbo angusto, apice subito dilatato, fasciisque duabus latis unâ basi, alterâ prope medium positis, ad disci marginem extensis, nigris.

Long. 6 lin.

Hab.—Ecuador.

This insect although having the facies of a *Pœcilaspis*, belongs undoubtedly (in my opinion) to the present genus. The three black patches on the disc of each elytron are arranged as follows: the first, placed on the outer disc below the shoulder, is usually attached by a short

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branch to the inner extremity of the basal marginal fascia; the second, on the inner disc near its middle, is placed near the suture; whilst the third, situated on the outer disc near the apical border of the elytron, is more or less connected with the latter, by an irregular branch.

Omaspides bivittata.

Subrotundata, postice attenuata, paullo convexa, nigro-æenea, subopaca, subtus nitida, antennis nigris; thorace semicirculari, lateribus apice rotundato-ampliatis, hinc ad basin oblique productis, disco opaco, tenuiter longitudinaliter canaliculato; elytris obscure æneis, thorace multo latioribus, humeris non prominulis, apice rotundatis, lateribus infra humeros fere ad medium rotundato-ampliatis, hinc ad apicem rotundato-angustatis, apice conjunctim acute rotundatis; disco elevato-reticulatis, reticulo nitido, disco externo pone medium sanguineo, areolas parvas, punctatas, opacas includente; margine laterali late explanato, paullo deflexo, obsolete et laxe reticulato, crebre punctato, vittâ latâ superficiem fere amplectente, paullo ante apicem desinente, sanguineâ, ornato.

Long. 6 lin.

Hab.—Ecuador.

O. bivittata may be known at once from *O. augusta*, Boh., the only species with which it might be confounded, by the very oblique sides of the thorax, and by the much coarser and more distinct reticulations covering the disc of the elytra.

Omaspides abbreviata.

Rotundata, paullo convexa, obscure æenea, nitida, antennis nigris; thorace subtilissime punctato, dorso tenuiter longitudinaliter canaliculato, medio ante basin transversim foveolato; elytris sat ampliatis, humeris non prominulis, late rotundatis, lateribus pone humeros ad medium rotundato-ampliatis, hinc ad apicem rotundato-angustatis; dorso subcrebre punctatis, margine laterali late explanato; flavis, limbo exteriori, suturâ, plagâ communi cruciformi, a basi fere ad medium extensâ, vittâque basali inter discum et marginem positâ, longe ante medium abbreviatâ, obscure æneis.

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Long. 6 lin.

Hab.—Ecuador.

Antennæ scarcely longer than the head and thorax, slightly increasing in thickness towards the apex; thorax nearly one-third broader than long, sides very oblique, slightly sinuate near the middle. Very close to *O. bistrigata*, Boh.; the antennæ shorter, the elytra less broadly dilated, surface rather more strongly punctured on the disc, the humeral angles less distinct, surface of dilated margin more deflexed.

Batonota distincta.

Subtriangularis, apice rotundata, viridi-ænea, supra opaca, subtus nigra, nitida; antennis nigris, basi fulvis; thorace longitudine plus duplo latiori, lateribus oblique ampliatis, basi rotundatis, fere parallelis, dorso impunctato, pube argenteo-sericeâ adpressâ dense vestito; elytris thorace multo latioribus, humeris antrorsum valde productis, apice acutis, extrorsum curvatis, dorso carinâ diagonali divisis; lateribus ante medium fere parallelis, pone medium ad apicem rotundato-angustatis, apice conjunctim rotundatis; dorso convexis, sparse cinereo-sericeis, basi retusis, deinde transversim gibbosis, subfortiter punctatis, punctis prope suturam seriatim, prope marginem, inordinatim dispositis; interstitiis duobus prope suturam alteroque disci elevatis; margine laterali tenuiter punctato. *Mas.*

Elytrorum humeris antrorsum minus productis, apice subacutis, extrorsum non curvatis; lateribus pone humeros ad apicem rotundato-angustatis, apicem versus citius angustatis, apice conjunctim subacutis. *Fœm.*

Long. 7 lin.

Hab.—Ecuador.

The male of this species may be at once known from congeneric forms, by the strongly produced humeral angles of the elytra; and both sexes by the dense sericeous pubescence clothing the disc of the thorax.

Batonota Jansoni.

Triangularis, convexa, nigra, supra opaca, subtus nitida, antennis nigris; thorace longitudine fere duplo latiori, lateribus oblique rotundatis-ampliatis, basin versus citius

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rotundatis; dorso medio carinato, pube tenui, adpressâ, cinereâ, sparse vestito; elytris thorace multo latioribus, humeris angulatis, antrorsum leviter productis, apice acutis, dorso carinâ diagonali divisis; lateribus pone humeros rotundato-angustatis, apicem versus citius rotundatis; dorso convexis, basi retusis, deinde transversim gibbosis, fortiter subseriatim punctatis, interstitiis duobus prope suturam alteroque disci carinatis; margine laterali antice late, postice modice explanato; obscure viridi-æneis aut nigro-æneis: maculâ parvâ irregulari pone gibbum plagâque magnâ prope medium marginis explanatis positis, ornatis.

Long. 6½ lin.

Hab.—Chontales.

Collected by Mr. E. Janson, junr., after whom I have named it.

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IV. *Descriptions of new species of Lucanoid* Coleoptera; *with remarks on the genus* Cantharolethrus, *and supplementary list.* By Major F. J. S. Parry, F.L.S. (*including descriptions by* M. Snellen Van Vollenhoven, and Prof. Westwood, M.A., F.L.S.).

[Read 5th February, 1872.]

Sphenognathus armatus, ♂ Parry, n. s. (var. max.). Pl. I. fig. 3.

S. viridi-opacus metallicus, brunneo-tinctus, partim nitente cupreo-viridis. *Pedes* concolores. *Mandibulæ* capite prothoraceque paulo breviores, robustæ, porrectæ, leviter arcuatæ, granulosæ, apicibus curvatis; supra in medium elevatæ, et prope basin denticulo suberecto, instructæ, interne fere ad apicem serratæ. *Caput* transversum, lateribus fere rectis; antice elevato-emarginatum, cum prothorace grosse et irregulariter punctatum, angulis ante oculos acutis (antennæ mutilatæ). *Prothorax* transversus, convexus, lateribus subrotundatis, minute crenulatis, angulis posticis obliquis, denticulo parvo instructis; disco basi binodoso et prope angulos posticis impressione profundo notato. *Elytra* prothorace latiora, elongata, convexis, fere parallela, sub lente minute granulosa, irregulariter vermiculata, prope scutellum glabra; angulis humeralis rotundatis; scutello subrotundato, tenuiter punctulato. *Pedes* robusti, tibiis anticis intus et extus, fortiter sed irregulariter armatis; tibiis, 4 posticis, spinis acutis 8 vel 9 instructis; tarsis ciliatis. Corpus subtus scutello regioque valde et longe fulvo- aut griseo-pilosa. Mandibulæ intus pone apicem, caput, prothoracis latera, femoraque subtus, pube fulva, longe, irregulariter et obsolete, tectis.

Hab.—Colombia. Mus. Saunders.

Long. corp. lin. 15; lat. lin. 7; long. mandib. lin. 5.

This interesting new species, is allied both to *S. Lindenii* and *S. Feisthamelii*, but its conspicuously greater length and width, in comparison with all the other species of the genus (*S. Granti* excepted), as well as its

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other characters, renders it amply distinct. It differs from *S. Lindenii* as follows:—The mandibles are more robust and arcuate, considerably more elevated on the upper surface; the prothorax much wider, with its punctuation considerably stronger, the posterior angles more rounded; the elytra are wider at the base, consequently more parallel. The character of the sculpture, especially near the apex, is more strongly vermiculate; the legs considerably more robust, with the denticulation of the tibiæ, infinitely more pronounced than in any other species of the genus with which I am at present acquainted. In reference to *S. Lindenii*, the armature of the four posterior tibiæ is entirely wanting. The sparse and irregular character of the pubescence exhibited on the upper surface, in comparison with that existing underneath, may show, perhaps, only an abnormal condition, caused by friction. The upper surface, when the insect is in its normal state, may probably prove to be villose, perhaps only on the prothorax and mandibles, a condition sometimes to be met with, but rarely, in other allied species. I am indebted to W. Wilson Saunders, Esq. for the opportunity of describing this new insect, as well as others hereafter mentioned.

S. armatus (?), ♀ (an sp. nov. ?).

S. nigro-castaneus, obscure æneo-tinctus. *Mandibulæ* curtæ, robustæ, granulosæ, extus prope basin rotundatæ, intus excavatæ, denticulatæ. *Caput* quadratum, antice elevato-binodosum, ante oculos tuberculo parvo instructum, cum prothorace rude et irregulariter punctatum. *Prothorax* transversus, subconvexus, lateribus minute crenatis, in medio longitudinaliter canaliculatus; angulis anticis rotundatis, posticis paullo emarginatis, acutis. *Elytra* prothorace latiora, convexa, parallela, confertim granuloso-subvermiculata, circa scutellum glabra, minute punctulata; angulo humerali rotundato. *Scutellum* semicirculare, punctulatum. *Pedes* robusti, rugoso punctati; ciliati; tibiis anticis et intermediis, spinis quatuor, posticis tribus, armatis. Corpus subtus sparsim et irregulariter pilosum.

Long. corp. lin. 9.

Hab.—Bogota. Mus. Parry.

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The insect now noticed differs so perceptibly from all other females of the species belonging to the genus, that I have no hesitation in recording it as being distinct, and I am much inclined to assume the probability of its eventually proving to be the ♀ of *S. armatus;* this conjecture must not, however, be taken as a definite conclusion. It assimilates with *S. armatus,* ♂, in having the same convex and parallel formed elytra, together with the vermiculate sculpture exhibited on their upper surface, although somewhat closer and strongly defined, this latter character may, however, be only sexual; it has, further, the same robust similarity in the appearance of the legs, as well as in the strongly armed tibiæ; this last chararcter, as previously stated, in respect to *S. armatus,* ♂, is certainly not to be met with in the females of any other allied species. With regard to the coloration: in the male it is characteristic as being "æneus, brunneo-tinctus;" whilst in the female it is noted as "brunneus, æneo-tinctus;" such variety of character is often exhibited in the females of other allied species. The legs of both insects are unicolorous, whilst the tibiæ of nearly all the other allied species have been described by the several authors as being of a light reddish-brown. With reference to the villose texture which is exhibited so strongly underneath, and, somewhat sparsely, on the upper surface of *S. armatus,* ♂, in the female insect there exists only considerable marks of such pubescence underneath, and, on the upper surface, traces only of this character are to be found at the exterior base of the mandibles, on the anterior margin of the prothorax, round the eyes, and also in the space between the base of the elytra and prothorax; in reference, however, to the last character alluded to, the insect may not, I apprehend, be in its normal condition. In conclusion, it may, I think, nevertheless be affirmed, that if the insect in question is not sexually related to *S. armatus,* ♂, it must be regarded as the female of another species, the male of which is at present unknown.

Genus CANTHAROLETHRUS, Thomson, Ann. Soc. Ent. Fr. 1862, p. 411.

Sp. 1. *C. Luxerii,* ♂, Buquet, Ann. Soc. Ent. Fr. 1843, Bulletin, p. li. (*Dorcus*), Colombia; *C. Luxerii,* ♂, Parry, Cat. pl. IX. fig. 6; *C. Georgius,* ♂, Thomson, *loc. cit.*, Colombia.

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(?) Sp. 2. *C. Reichii*, ♀, Hope, Trans. Ent. Soc. ser. i. vol. IV. p. 182, pl. 13, fig. 3 (*Pholidotus*), Colombia; *C. Reichii*, ♂, Thomson, *loc. cit.*

Sp. 3. *C. Buckleyi*, ♂ ♀, n. sp., Ecuador.

The type specimen (♂) from which both M. Buquet and Mr. Thomson described their remarkable and interesting species of Lucanoid Coleoptera was, up to a very recent period, unique in Count Mniszech's collection; three or four specimens, however (males), were received by Mr. Janson from N. Granada during the past year, but, unfortunately, no female was contained in the collection. These specimens have been distributed in the collection of the British Museum, of Mr. W. Wilson Saunders, and in my own. M. Buquet's description of *C. Luxerii* is given entirely in French; Mr. Thomson's characters, both of the genus and the species, in Latin, are *in extenso*. A second species of the genus, also recorded by Mr. Thomson in the same publication, was founded upon an insect originally described in the Transactions of our Society by the late Rev. F. W. Hope, under the name of *Pholidotus Reichii*, ♀; it was located by Mr. Hope, but with some hesitation, in the genus *Pholidotus*. Mr. Thomson, in his publication, inclines to the opinion that *Pholidotus Reichii*, Hope, is identical with the insect he describes under the name of *Cantharolethrus Georgius*; the probability as to the former insect being the female of the latter (or perhaps of another closely allied species), was also alluded to in my Catalogue of the Lucanoid Coleoptera (*vide* Tr. Ent. Soc., 1870). The question as to the sexual affinity between the two insects may now, I further apprehend, be definitively settled; as the female of another species assimilating closely to *C. Reichii* has recently been discovered by C. Buckley, Esq., during his recent travels in the States of Ecuador. It was taken, together with several male specimens, in the interior of some rotten wood; a description of this new species is now added under the name of *C. Buckleyi*. Mr. Thomson appears to be in error in stating that a specimen of *C. Reichii* is to be found in the Hopeian Cabinet; hitherto this insect has, I believe, remained unique in his own collection, having been obtained from that of the Marquis de la Ferté, and is, probably, the identical specimen from which Mr. Hope's description and figure were taken. For the sake of comparison, in respect to certain differen-

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tial characters existing between *C. Luxerii* and *C. Buckleyi*, extracts from the descriptions given by Mons. Buquet and Mr. Thomson are quoted. Mons. Buquet says:—

"The *mandibles* are one-third longer than the head and prothorax together, wide and flat upon their upper surface, bifurcate at their extremity, emarginate and armed with a strong tooth close to the apical termination; *antennæ* the length of the mandibles, the joints being flattened from the second, the sixth joint being considerably more dilated, the four last joints, which form the clava, being short. *Prothorax* convex, narrow in front, broad at the base, finely punctured above, and rugose underneath; the posterior angles deeply emarginate, forming a very acute angle. *Elytra* oval, elongate, rounded at the extremity as well as at the humeral angles.

Mr. Thomson's description of *C. Georgius* is as follows:

"*Mandibulæ* elytris longiores, subrectæ, validæ, singulæ post medium intus dente sat valido armatæ, versus apicem extus abrupta, truncatæ, apiceque valde bifidæ; *antennæ* elongatæ, mandibulis longiores, 10-articulatæ, scaphus prothorace longior, articulis 3, 4, 5, 6 gradatim decrescentibus, clava 4-articulato; *prothorax* subtrapezoidalis, ad angulos laterales posticos latiori illos productos acutos; capite vix longior, marginibus anticis posticisque sinuatis. *Elytra* oblonga ad humeros latiora, margine paulo reflexo, apice rotundata."

This description of the insect appears in the main to correspond with that of Mons. Buquet, with the exception that the author does not allude in any way to the humeral angles of the elytra, which Mons. Buquet states to be rounded.

C. Buckleyi, n. sp. ♂, Parry (var. max.). Pl. I. fig. 1.

C. niger, nitidissimus, glaberrimus. *Mandibulæ* elytris breviores, robustæ, arcuatæ, fere cylindricæ, punctatæ, intus prope basin binodosæ; apicibus bifurcatis, intus post medium emarginatis dente, acuto armatis. *Caput* magnum, punctatum, antice fortiter emarginatum; angulis ante oculos productis; disco triangulariter excavato; clypeo parvo, binodoso. *Antennæ* elongatæ, mandibulis

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longiores; articulis cylindricibus. *Prothorax* transversus, supra sparsim, infra fortiter et rugose, punctatus; lateribus productis, rotundatis, minute crenatis, angulis posticis, emarginatis, tuberculo acuto instructis; in medio leviter longitudinaliterque canaliculatus. *Elytra* glabra; lateribus irregulariter indentatis; linea marginali paulo reflexa; angulis humeralis spina obtusa instructis. *Scutellum* subrotundatum, in medio punctulatum. *Pedes* punctati; tibiis anticis prope apices spinis 3 vel 4, minutis, armatis, intermediis posticisque simplicibus.

Long. corp. unc. 1, lin. 2; long. mandib. lin. 5.

Hab.—Ecuador, Amer. merid. Muss. Brit. et Parry.

There is indubitably a very strong facial appearance of great similarity between the two insects in question, but the following differences are, I think, quite sufficient to prove their non-identity. The general appearance of *C. Buckleyi*, ♂, is somewhat more shining, the mandibles are shorter and more robust, broader at the base, being also more arcuate; the joints of the antennæ, between the funiculis and the clava, are cylindriform, instead of flat, as in *C. Luxerii*; they are also longer, consequently the scapus is visibly more elongate, the dilatation at the extremity of the sixth joint is not quite so pronounced, the seventh or basal joint of the clava (which, according to the author, is composed of four joints) is considerably longer. The clypeus in *C. Buckleyi* is, moreover, binodose at the extremity, whilst in the allied species it is simple. The *head* is much broader, more excavated in front, with the anterior part more emarginate. The prothorax is of a totally different form, being prominently wider, and rounded at the sides, with the posterior angles considerably less acute; and, finally, the elytra are slightly longer, with the humeral angles acute instead of being rounded.

C. Buckleyi, ♀. Pl. I. fig. 2.

C. niger. *Mandibulæ* parvæ, rugosæ. *Caput* fere quadratum fortiter rugoso-punctatum, angulis ante oculos rotundatis. *Prothorax* transversus, valde varioloso-punctatus, disco in medio et prope lateribus, longitudinaliterque, lineis rugosis, elevatis, irregulariter, instructus; lateribus serratis, angulis anticis prominulis cum posticis

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emarginatis, spina acuta instructis. *Antennæ* capite mandibulisque paulo longiores; articulis cylindricis. *Elytra* elongata, disco subvelutinoso-opaco; linea sinuata utrinque, elevata et obsolete punctata, e spina humerali fere ad medium descendente notata. *Scutellum* parvum, grosse punctulatum, nitidum; angulis humeralis spina acuta instructis; linea suturali, glabra, nitida. *Corpus* infra nigrum; pectore fortiter varioloso-punctato. *Pedes* punctati; tibiis omnino simplicibus.

Long. prothoracis cum cap. et mand. lin. 5. Elytr. lin. 6.

Hab.—Ecuador. Mus. Parry.

Not being in a position to avail myself of a comparison between the two insects, viz., *C. Reichii* and *C. Buckleyi*, it is impossible to point out the special differences which I have no doubt exist in the females, as well as in the males of the respective species, as already alluded to. The only difference I have detected from reading Mr. Thomson's description of *C. Reichii*, ♀, is, that with reference to the elytra, the author says, "*humeris prominulis, rotundatis*," whilst in *C. Buckleyi*, ♀, the humeral angle is acute, and furnished with a spine; this same difference has been pointed out as existing in the males of the two species.

In Mr. Hope's description of *C. Reichii*, the rich opaque velvet appearance exhibited in the elytra is not alluded to, neither is there any notice as to the character of the humeral angle: the author describes the *length* of the insect as being 15 lin., whilst the length of *C. Buckleyi*, is only 11 lin. Mr. Thomson gives the length of *C. Reichii* as 30 mill., being considerably in excess of *C. Reichii*, Hope. The insects now described, were found, as previously stated, by Mr. Buckley, at the same time, and in the same position (the interior of rotten wood), thus proving, as far as possible, their conjugal affinity; only *one* specimen of the female was obtained. These interesting insects formed part of a large and rich collection of Coleoptera that Mr. Buckley has brought back from his recent scientific expedition to Ecuador. His safe return will, I am sure, be hailed with much satisfaction by the members of the Entomological Society.

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Leptinopterus affinis, ♂, Parry, n. s. (var. max.: ♀ *ignota*). Pl. I. fig. 5.

Affinis *L. V-niger*, nigro-piceus. *Mandibulæ* capite prothoraceque paullo longiores, deplanatæ, irregulariter arcuatæ, intus tuberculis parvis quatuor, pone apicem processuque bifido, instructæ. *Caput* prothorace paullo angustius, antice emarginatum, ante oculos fortiter angulatum; lateribus fere rectis. *Prothorax* bifoveatus, in medio longitudinaliter leviterque canaliculatus; scutello ciliato. *Elytra* testacea, prope scutellum plaga triangulari notata; angulis humeralis tuberculo parvo instructis. *Pedes* inermi; femoribus in medio rubro-maculatis.

Long. corp. lin. 7; mandib. lin. 3.

Hab.—In Brasilia merid. apud fluvium Paranam.

There is great affinity between this insect and *L. V-niger*, Hope (*triangularis*, Burm.); but after comparing it with several specimens of the latter species, I find the following marked differences between the two; the mandibles are not regularly arcuate, becoming abruptly incurved, near the apex; the prominent subapical bifid tooth I have in no case met with in specimens of *L. V-niger*; moreover, the mandibles are, internally, considerably more emarginate near the apex. The two foveæ, exhibited on the disc of the prothorax, are also peculiar to this species (unless they may ultimately prove to be abnormal). The triangular plaga on the elytra is considerably smaller, originating at a very slight distance only from the scutellum, whereas, in the former, it proceeds almost from the humeral angle; the punctuation of the elytra is also scattered and sparse, whereas, in *V-niger* it is lineo-punctate; the legs, moreover, are entirely black, with the exception of the femora being rufous in the centre, whilst in *L. V-niger* the legs are constantly red. This species belongs to the second section of the genus, having the armature of the mandibles symmetrically placed on each side.

Leptinopterus Paranensis, ♂, Parry, n. s. (var. max.: ♀ *ignota*). Pl. I. fig. 4.

L. niger, opacus, sub lente minute punctulatus. *Mandibulæ* graciles, leviter arcuatæ, fere cylindricæ, intus excavatæ, tuberculo obtuso prope basin, spina minima

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ante medium, dentibusque duobus subapicalibus, instructæ. *Caput* quadratum, margine antico emarginato, angulis ante oculos obliquis. *Prothorax* transversus, augulis posticis emarginatis, vix tuberculatis. *Elytra* brevia, prothorace angustiora, angulo humerali spina minuta instructo. *Pedes* nigri; tibiis anticis spinis tribus prope apices armatis, 4 posticis inermibus; tarsis ciliatis.

Long. corp. lin. 7; mandib. lin. 3. Mus. Saunders.

Hab.—In Brasilia merid. apud fluvium Paranam.

The slender cylindriform mandibles, the short and narrow elytra, together with the entire absence of golden pubescence on the scutellum, and on the anterior margin of the prothorax, readily characterize this insect as being distinct from any other allied species of the genus which has at present fallen under my notice; it is to be located in the second section of the genus.

I have been requested by Mons. Snellen van Vollenhoven, of Leyden, to submit to the Society upon the present occasion, the description (accompanied by a figure) of a new and interesting species belonging to the genus *Prosopocoilus*. The insect in question is peculiarly remarkable, as being the only one belonging to the genus in which the coloration is found to be *æneous*.

Prosopocoilus Rosenbergii, Vollenh., n. s. Pl. II. fig. 1.

"P. æneus, nitidissimus, latus; capite magno, impunctato; mandibulis forcipiformibus, intus serratis, apice dentibus tribus divaricatis desinantibus; dentibus illis, antennis, palpis et tarsis, nigris."

"Long. lin. 28."

"*Hab.*—Java, interior (?)."

"Body above and beneath, of a coppery-brass colour, large and stout of dimension. Head broad, depressed, deeply emarginate in front, not punctate, but of the same colour as the thorax and elytra. Mandibles somewhat shaped like those of *Pros. forceps*, Voll., but elevated towards their ends, concave at the outer side, with a small interior tooth at the base, and four or five at the end of the inner ridge; the apex of each mandible is

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divided into three larger teeth, which are deeper in colour, as also are the labrum and the sides of the head. The palpi shining black. Eyes chestnut colour, the canthus in front ending in a black knob where the posterior canthus terminates, so that it is difficult to distinguish even with a good glass, whether the canthus is entire or not. Prothorax broader than either head or elytra, shining, but punctate on the anterior part, very convex in the centre, the lateral tooth subacute. Scutellum with a golden tinge, edged with black, with some few scattered punctures. Elytra shining, minutely punctate, with a single short row of somewhat greater punctures, all the edges blackish. There is a small longitudinal black impression in the middle of the underside of the metathorax. Legs stout; all the tibiæ with scattered punctures, out of which arise short golden hairs. Tarsi and claws shining black."

"The only specimen of this magnificent species was brought to Europe by Baron Von Rosenberg, who obtained it at Java, where it was found in the Botanical Garden of Buitenzorg. There is some doubt as to its being a Javanese insect, and it seems rather probable that it was imported from Siam, since a great number of trees and plants had been brought, in the preceding year, from that country to the botanical garden."

Prof. Westwood has favoured me with the following description.

Ceratognathus rufipennis, Westwood, n. sp. Pl. II. fig. 2.

"C. niger, nitidus; capite rugoso, in medio verticis tuberculo transverso, bipartito, notato; mandibulis capitis longitudine, supra parum subangulatis, haud auriculatis, apice bifido; prothorace cicatricoso-punctato, spatiis nonnullis discoidalibus lineaque mediana postica lævibus; elytris rufis, rugoso-punctatissimis, singlo 4 costatis costis 2° et 4° e sutura magis elevatis, ante apicem desinentibus; pedibus sat gracilibus, tibiis anticis bidentatis, posticis emarginato-incisis; corpore infra nigro, nitido, cum mandibulis et femoribus punctatis, serie punctorum majorem prope marginem posticum segmentorum abdominis, notato."

"Long. corp. lin. 4½."

"*Hab.*—Albany, King George's Sound (Brewer). In Mus. Saunders."

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I avail myself of the present occasion to notify the following numerical rectifications found to be requisite since the publication of my Catalogue of the Lucanoid *Coleoptera* in 1870 (*Vide* Tr. Ent. Soc. 1870, pp. 104-116).

NEW SPECIES.

1. *Sphenognathus armatus*, ♂ ♀, Parry, *ante* p. 33. Mus. Saunders, ♂; mus. Parry ♀.
2. *Lucanus*, ♀, inedit Formosa. Mus. Parry.
3. *Rhætulus crenatus*, ♂, Westwood, Tr. Ent. Soc. 1871, p. 353. Mus. Parry.
4. *Prosopocoilus Rosenbergii*, ♂, Voll., *ante* p. 81. Mus. Leyden.
5. *Cyclommatus*, ♀, inedit, Borneo bor. Mus. Parry.
6. *Cantharolethrus Buckleyi*, ♂ ♀, Parry, *ante* pp. 77, 78. Mus. Parry.
7. *Leptinopterus affinis*, ♂, Parry, *ante* p. 80. Mus. Saunders.
8. *Leptinopterus Paranensis*, ♂, Parry, *ante* p. 80. Mus. Saunders.
9. *Dorcus suturalis*, ♂, Westwood, Tr. Ent. Soc. 1871, p. 358. Mus. Parry.
10. *Dorcus raticionativus*, ♂, Westwood, Tr. Ent. Soc. 1871, p. 356. Mus. Parry.
11. *Dorcus glabripennis*, ♂, Westwood, Tr. Ent. Soc., 1871, p. 359. Mus. Parry.
12. *Apterocyclus Honoluluensis*, ♂ ♀, Waterhouse, Tr. Ent. Soc. 1871, p. 315. Mus. Brit.
13. *Ceratognathus rufipennis*, ♂, Westwood, *ante* p. 82. Mus. Saunders.

The following species were inserted in the Catalogue under MS. names; descriptions have since been published.

1. *Lissotes Launcestoni*, ♂, Westwood, Trans. Ent. Soc. 1871, p. 365.
2. *L. latidens*, ♂, West., *loc. cit.*, p. 363.
3. *L. subcrenatus*, ♀, West., *loc. cit.*, p. 368.
4. *L. furcicornis*, ♂ ♀, West., *loc. cit.*, p. 362.
5. *L. forcipula*, ♂, West., *loc. cit.*, p. 366.

Species recorded as wanting to my Collection in 1870, but since added.

1. *Colophon Thunbergii*, Westwood.
2. *Odontolabis Burmeisteri*, Hope.
3. *Odont. striatus*, Deyrolle.
4. *Cantharolethrus Luxerii*, Buquet.
5. *Platycerus cærulescens*, Leconte.
6. *Nigidius Parryi*, Bates.
7. *Nigidius Formosanus*, Bates.

Number of species recorded in 1870	357
Number added in 1871-2	13
Total	370
In Mus. Parry	302
Desiderata . .	68

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Explanation of the Plates.

Plate I.

Fig. 1. *Cantharolethrus Buckleyi*, Parry, ♂.
2. *C. Buckleyi*, Parry, ♀.
3. *Sphenognathus armatus*, Parry, ♂.
4. *Leptinopterus Paranensis*, Parry, ♂.
5. *L. affinis*, Parry, ♂.
6. Head of *Odontolabis Stevensii*, Thomson, ♀, exhibiting singular malformation of the antennæ.

Plate II.

Fig. 1. *Prosopocoilus Rosenbergii*, v. Voll., ♂; 1*a*, *b*, apex of mandibles; 1*c*, side of head; 1*d*, antenna.
2. *Ceratognathus rufipennis*, Westw., ♂; 2*a*, maxilla and palpus; 2*b*, labium and palpi.

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V. *Descriptions of some new* Papilionidæ. By J. O. Westwood, M.A., F.L.S., Pres. Ent. Soc.

[Read 3rd July and 4th December, 1871.]

The vast additions which have, within the last twenty years, been made to our Entomological Collections from almost all parts of the world, and the more careful indication of the localities of individuals from adjoining districts, have not only resulted in the description of great numbers of distinct species, but have also made us acquainted with numbers of locally distinct races, or geographical varieties, or sub-species, as they have been variously termed, the study of which, especially as regards the manner in which the variation in the different individuals or races may have been effected, if at all, and especially what may be the value of the characters which are thus seen to vary, is still quite in its infancy.

In the Paper which I now present to the Society, I have described several Butterflies belonging to the great genus *Papilio*, some of which seem quite distinct from all the already described species; whilst others may possibly be regarded as permanent local varieties. To the latter, in the present state of the science of Entomology, it will, I think, be desirable to assign *names*, but, in accordance with a plan, which I have elsewhere adopted, I have given them names which at once indicate their apparent connexion with the species to which, in a wide sense, they appear to belong. I have also taken some pains to indicate the manner in which the variations in the different species occurs. The older writers, of course, did not hesitate to consider the sub-species as identical with the type; hence we find Fabricius writing the MS. name of "*Papilio Idea*, var. β" as the identification of a drawing of *Hestia Leuconoe*, of Erichson, in the volume of Jones's 'Icones' containing the *Papiliones Danai*, three-quarters of a century before it was described by Erichson; and many other instances might be quoted, in which both Linnæus and Fabricius described, under the same name, individuals now regarded even as more distinct than geographical sub-species or varieties.

The careful investigation, indeed, in all its bearings, of these wild local varieties (assuming them to be such) seems to me to be likely to afford more important data

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in the solution of the question of the evolution of natural objects, than whole volumes of details of experiments made upon domesticated, or semi-domesticated animals, which appear, from their very nature and position in the general scheme of the economy of the Creation, to have been endowed with a great degree of plasticity, to fit them for the changes of existence to which man would subject them.

If we look at most of the insects described below, and indeed at many of those which have lately been described by our leading Lepidopterists, we find these local varieties distinguished by some modification in the size or position of the markings of the wings; or, very rarely indeed, by some actual variation in form. If, indeed, we possessed a knowledge of their transformations, we might be better able to judge of the proper weight to be accorded to such variations; but it is hard to understand how the fact of a butterfly transferring its location a certain number of miles, should be attended with an alteration in its markings which can in no wise affect its means of living.* It is not difficult to suppose that a change of locality, attended possibly with a supply of food of a more or less nourishing quality, might effect an alteration in the size of the specimen, but that it should result in a few, more or less, of the scales in the wings being *differently sculptured,* thereby producing a corresponding difference of colour, is not so intelligible; experiments as to the capability of these local varieties breeding together would be very decisive, but in the present state of science, it seems quite impossible to determine the limits of these varying species, and we, consequently, have the same author in one place regarding each sub-species as distinct, and in other cases giving them under one specific name; thus, in the last Catalogue of the 'Diurnal Lepidoptera,' recently published, Mr. Kirby gives all the sub-species of the *Priamus* group as varieties of *Orn. Priamus,* whilst those of the *Paris* and *Helena* groups are treated as distinct species.

Papilio Buddha, nov. sp. Pl. III. fig. 1.

P. alis nigris basi viridi-atomosis, fascia lata communi cærulea vel aureo-viridi (secundum situm) ad costam pos-

* These observations were written some months before the appearance of Mr. W. H. Edwards's memoir on *Papilio Ajax*, in which two supposed sub-species have been satisfactorily shown to be *seasonal* variations, such as are well known to occur in some of our English moths.

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ticarum haud extensa, posticis macula lunata in angulo externo costæ lunulaque parva ad angulum analem luteis, lunulis 4 subapicalibus, fere indistinctis, viridi-atomosis.

Expans. alar. unc. 3¾.

Hab.—— ? In Muss. Hewitson et Druce.

This fine insect belongs to the *Palinurus* group, and is closely allied to *P. Brama* and *Dædalus*, but is distinguished by its larger size, and by the great extent of the fascia in the hind-wings; in the fore-wings this gradually widens from the costa to the inner margin, where it is half an inch in breadth; its margin towards the base of the wing is nearly straight, but on the side next the apical margin it is more scalloped between the veins; it extends exactly to the extremity of the discoidal cell between the two discocellular veins, but beyond the cell between the upper of these veins and the fore-margin; in the hind-wings, it forms a large oval patch, occupying the whole central disc of the wing, gradually shaded off behind, and not reaching to the costa, but extends upwards along the anal margin, and covers portion of the discoidal cell; the basal portion of all the wings is thickly powdered with golden green scales, the apical portion of the fore-wings being much more strongly irrorated with them; near the outer angle of the hind-wings, is a fulvous broadly lunate spot, and a smaller and narrower one near the anal angle; the tail is not powdered with scales; between the large discoidal spot, and the hinder margin of the hind-wings, is a series of four very obscure lunules formed of a few green scales, and there are a few fulvous scales in the space next the outer angle. The wings below are brown, the whole of the dark portion which extends to beyond the middle of the wings being thickly irrorated with luteous scales, which are thickest on the inner portion of the basal part of the fore-wings, and the basal portion of the hind-wings (extending to about the extremity of the abdomen) in which parts the ground-colour is paler brown; a very pale buff-brown fascia on the fore-wings commences at a greater distance from the end of the discoidal cell than the extremity of the blue-green fascia reaches on the upper side of the fore-wings, and is traversed by the black veins and the brown intermediate longitudinal folds. The apical margin is brown, gradually narrowing from the apex to the inner angle of the fore-wings. On

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the hind-wings the bar beyond the dark portion is of a more fleshy-brown colour, the apical margin darker, and with a row of black, fulvous, and silvery lunules, of which the interior forms a bilunate ocellus at the anal angle.

Of the species with a green fascia across all the wings, of which *Papilio Crino* may be considered as the type, we find that species and *P. Blumei* distinguished by having the tails of the hind-wings more or less irrorated with metallic blue or green scales, the band in *P. Crino* running across the wings entirely beyond the discoidal cell, whilst in *P. Blumei* it is so much advanced towards the base, that it does not at all, in the fore-wings, and only slightly in the hind-wings, extend beyond the cell.

As regards the nomenclature and specific identification of the two Fabrician species with a green fascia across all the wings, but having no spots on the tails, we fortunately possess satisfactory materials in this country.

Papilio Crino, Fabr.

This was described by Fabricius from the collection of Drury, with an erroneous locality, Africa, but with a reference to Jones's 'Icones,' V. I. pl. 53. Donovan, who figures the species in his 'insects of China,' states that he does so on the authority of Drury's collection, and Boisduval states that he received it from Cochin China. Jones's drawings do not give any locality, but the fascia not extending either in fore or hind-wings into the discoidal cells, and the green spot close to the tip of the tails of the hind-wings, at once separate this species from all it allies. There are two males of *P. Crino* in the British Museum, in which there is a very small patch of green scales at the lower extremity of the discoidal cell of the fore-wings. These are wanting in the specimen in the Hopeian collection, and in others which I have seen, especially in specimens in the collection of the Rev. E. Savory, from Ceylon, some of which, males, have the first and second branches of the median vein clothed with a narrow stripe of brown hairs (more slender on the second branch), whilst these branches are quite naked in other male specimens. According to Dr. Felder (Catal. Pap. pp. 34, 82), these naked individuals are from the mountainous part of Ceylon, and he has accordingly applied to them the specific name of *P. montanus*, adding that the mountain individuals have the fascia in the hind-wings, especially of the females, broader and more brightly coloured than the littoral specimens.

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Papilio Palinurus, Fabr.

P. Palinurus was described by Fabricius (*Mantissa*, p. 2) from the collection of Lund, as a native of Tranquebar. Fortunately, Sir Joseph Banks also possessed the same species from Tranquebar, and in Mr. Jones's drawings it is represented from the Banksian specimen from that country, which is still preserved in the British Museum. The fascia of the fore-wings is rather narrow, and of nearly equal width, where it crosses the branches of the median vein; it is narrowed where it crosses the end of the discoidal cell, extending a short distance beyond it; the fascia of the hind-wings is transverse, narrowly ovate, reaching close to the anal margin of the wing, and resting on the top of the anal ocellus.

In the 'Revue Zoologique' for 1840, M. Guérin-Méneville separated, under the name of *P. Brama*, the specimens from the "côte malaye," having the "bande des ailes supérieures large, passant sur l'extrémité de la cellule discoidale et étant coupée en deux *parties égales* par cette extrémité," whilst he retains the specific name of *P. Palinurus* for those which have the "bande tres large, passant en delans de l'extrémité de la cellule discoidale et touchant seulement cette extrémité," and which have a broad central dark fascia, nearly destitute of pale scales in the hind-wings beneath.

In the figures of the two sexes of *P. Brama*, the male is represented with a much broader fascia in the fore-wings, whilst in the hind-wings it is broadly ovate, extending considerably within the discoidal cell, which is not the case with the figure of the female.

In Mr. Hewitson's collection are three apparently distinct forms of these insects:—

1. The fascia on the fore-wings has the posterior half of nearly equal breadth, and it is here extended so much towards the hinder angle of the wings, that its inner margin, when it touches the posterior edge of the wing, is nearly ten lines distant from the body, and on the hind-wings the fascia is very transverse and narrowed, conical in its form, not quite extending to the anal margin considerably above the ocellus at the anal angle. This appears to me to represent the typical *P. Palinurus*, and such specimens of *P. Brama*, of Guérin-Méneville (pl. I. f. 4) as he considered to be the females.

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2. With the fascia on the fore-wings gradually widening to the hind-margin; it is more oblique, so that its inner edge, where it joins the posterior margin of the wing, is not more than half-an-inch from the thorax. In the hind-wings the fascia is very broad and ovate, extending to, and along, the anal margin, from opposite the extremity of the abdomen nearly to the fulvous lunule of the ocellus at the anal angle. There is a brilliant coloured specimen of this variety from South India, in the British Museum. This, according to M. Guérin's views, ought to be considered as the male of *P. Palinurus* (*Brama*, Guér.). I have not had an opportunity of carefully examining the sexual organs of these butterflies, and if it should be ascertained that the specimens with the broad fascia of the hind-wings are not exclusively of one sex, it will be necessary to give a distinct name to this No. 2.

3. (*P. Dædalus.*) The fascia of the fore-wings is here also gradually widened to the hind-margin, and is more transverse, its inner edge, where it reaches the posterior margin of the wing, being nearly three-fourths of an inch distant from the body, and the fascia in the hind-wing is more oblique, conical in form, and extending at its extremity next the body, only to the inner upper angle of the anal ocellus. This agrees with Guérin's figure (pl. I. fig. 2), of *P. Palinurus*.

It appears to me evident from these descriptions, that M. Guérin-Méneville has misapplied these specific names; that his *P. Brama* is identical with the *P. Palinurus* of De Haan (pl. 7, f. 3) and with *P. Regulus* of Stoll.; whilst his *P. Palinurus*, with the green bar not extending beyond the cell of the fore-wings, and with the dark fascia on the underside of the hind-wings, is identical with *P. Dædalus*, of Felder.

Papilio noctula, nov. sp. Pl. IV. fig. 3.

P. alis maris nigro-cyaneis, posticis et dimidio postico anticarum purpureo-nitidis; anticis latis, posticis parvis, mediocriter sinuatis; palpis, collo et thoracis lateribus, subtus rufo-notatis.

Expans. alar. antic maris unc. 4½.

Habitat in Borneo. Mas in Muss. Oxon., Hewitson, Druce.

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This species belongs to the group of which *P. Nox* is the type, and I should probably not have erred in uniting as sexes of the same species, the male insects above described under the name of *P. Noctula* from Borneo, remarkable for the large size of the fore-wings, glossed with rich raven-purple on the upper side; and the fine female specimens described below, under the name of *P. Strix*, also from Borneo, in the collection of Mr. Hewitson.

As, however, we possess no certain information as to the specific identity of these two insects, and as it may prove, ultimately, that *P. Noctula* may be the male form of *P. Erebus* of Wallace, also from Borneo and Malacca, the hind-wings of the females of which are glossed with steel-blue, of which there is no trace in *P. Strix*, I have thought it best, provisionally, to describe the two sexes as distinct. If *P. Strix* should ultimately be found to be the genuine partner of *P. Noctula*, the latter name, in accordance with the established usage for retaining the name given to the males must be employed, and that of *P. Strix* abandoned.

For the purpose of comparison with the only known males of this group hitherto described, namely, that of *P. Noctis*, of Hewitson, also published as such from Borneo, by Mr. Wallace, in the Trans. Linn. Soc. (XXV. Pl. V. f. 1), I have given a careful outline of the typical specimen of this male now in Mr. Hewitson's collection on pl. IV. fig. 2, from which it will be at once seen that, although having much more rounded and broader fore-wings than the male of *P. Nox* (of which a figure is now, for the first time, represented on pl. IV. fig. 1, also from the collection of Mr. Hewitson, from Java, formerly in coll. Wallace, and in the British Museum, from Pulo Penang). The male of *P. Noctula* has still larger and broader fore-wings, whilst the hind-wings are more slightly sinuated on the hind-margin than in *P. Nox*, male, but more decidedly so than in *P. Noctis*, male.

The three males are also well distinguished by the colour of their wings, that of *P. Nox* being black with a slight brownish tinge, the apex of the fore-wing beyond the cell, extending about half-way along the apical margin being paler, and gradually faded off to black-brown, with black veins, and slender black lines between the veins.

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The male of *P. Noctis* is more glossy black, with the apical portion of the fore-wings scarcely lighter than the basal portion: whilst the male of *P. Noctula*, in addition to the raven-purple colour of the upper side of the wings, has the two discoidal veins and the two terminal branches of the post-costal vein of the fore-wings slightly marked on each side with a few luteous scales on the upper side, whilst on the under side (which wants the purple gloss), the six terminal longitudinal veins of the fore-wings are more distinctly margined with luteous lines; the hind-wings are small.

The male of *P. Nox* is further distinguished by having the front of the head and palpi clothed with pinkish-red scales, as well as the posterior orbit of the eyes; there is also a spot of the same colour in front of the fore-wings, and one beneath the base of each wing; the anal valves are also partially clothed with pinkish-red scales.

The male of *P. Noctis* has the face and anal valves blackish-brown, and destitute of the red scales, whilst the male of *P. Noctula* has the lower part of the face slightly, and the whole of the palpi, as well as the sides of the collar and thorax, close to and beneath the base of the wings, red.

Papilio Strix, nov. sp. Pl. IV. fig. 4.

P. alis fœminæ magnis, late ovatis, nigris; omnibus longitudinaliter luteo-striatis; posticis mediocriter sinuatis corpore nigro, facie, palpis, lateribus colli thoracisque subtus alarum basin, anoque, rufo-notatis.

Expans. alar. unc. 5½.

Hab.—Borneo. In Mus. Hewitson.

The female specimens (Pl. IV. fig. 4) in the collection of Mr. Hewitson, which, from the identity of their locality, I have considered may possibly be the true partners of the males described above as *P. Noctula*, have very large oval fore-wings, resembling those of *P. Nox*, whilst the hind-wings are also comparatively of large size, but less strongly sinuated than in *P. Nox*, thus resembling *P. Erebus*, Wallace, Linn. Trans. XXV. p. 41 (from Malacca =*P. Nox*, var. De Haan, Verh. t. 5, f. 3, 3), from Banjermassing, Borneo.

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In the fore-wings, the portion of the post-costal vein, between the origin of its second and third branches, is of nearly equal length, with the spaces between the third and fourth branches; the third branch arises at a small distance beyond the cell, and the terminal portion of the post-costal vein, beyond the insertion of the fourth branch, is three times the length of the space between the origin of the third and fourth branches: whereas, in *P. Nox* and *P. Erebus*, the space between the third and fourth branches, is much elongated, and occupies nearly two-fifths of the length of the post-costal vein between the end of the cell and the tip of the wing, and the space between the second and third branches is only two-thirds of the length of that between the third and fourth branches.

The wings, both above and below, are black, strongly marked with longitudinal cream-coloured stripes on either side of the longitudinal black veins, the discoidal cell is also marked with a number of similar lines less decidedly. The hind-wings are also similarly marked on each side of the longitudinal veins, the incisures of the hind-wings are not so deep as in *P. Nox*, the four central ones being marked by small triangular cream-coloured spots, the face, sides of the thorax, and extremity of the body are clothed with scarlet scales.

The female of *P. Nox* (*P. Memercus*, Godart) is brown above, with the apical half of the fore-wings strongly marked with brownish-white scales on each side of the veins, the hind-wings being uniformly brown on both sides.

The female of *P. Erebus* is black above; the veins, especially at the apex of the fore-wings, margined with white scales, becoming gradually more sooty towards the inner angle, and the under wings are raven-black, each of the spaces between the veins, beyond the cell, bearing a large triangular jet black spot.

The female of *P. Noctis*, Hewitson, Proc. Zool. Soc. 1859 (p. 423, pl. LXVI. f. 5, 6), is described thus:—"upper side dark brown; all the nervures, except those which enclose the cell, margined with lighter colour, with white near the apex of the anterior wing and the outer margin of the posterior wing; posterior wing with a band of dirty white near the outer margin; outer margin of both wings light yellow. Underside as above, except that the margins of the nervures of the anterior

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wing are whiter, and that the outer margin of the posterior wing is broadly cream-colour, marked with a double row of black spots."

"Expans. $4\frac{9}{10}$ inch."

"*Hab.*—Borneo."

Papilio Papone, nov. sp. Pl. III. fig. 2.

P. alis anticis elongato-triangularibus, posticis brevioribus, subtriangularibus, sinuatis; omnibus supra cyaneo-nigris; posticis pone medium maculis 5 elongato-trigonis, postice bifidis, serieque macularum 7 subapicalium, intermediis lunatis, albidis, harum interna fulva, incisuris tenuiter albidis, interna etiam fulva; alis subtus rufo-fuscis, posticis ut supra maculatis, incisuris late fulvis.

Expans. alar. antic. unc. $4\frac{1}{2}$.

Habitat in India orientali D. Pratt. In Mus. Hopeiano Oxoniæ (*olim* nostr.).

This species is closely allied to *P. Panope*, in the style of the markings of the hind-wings; but, on the upper side, all the wings are of a rich blue-black, the anterior being entirely immaculate,* and elongate triangular, whilst the hind-wings are subtriangular, the apical margin appearing as though truncate instead of being rounded as in *P. Panope*. The sinuations of the hind-wings are of moderate depth, with whitish incisures; these wings are marked beyond the middle with a row of five large spear-shaped marks, followed by a row of lunules, of which the inner one is fulvous, and the four others cream coloured, followed towards the outer angle by two oval spots of the same colour; the marginal incisures are very slenderly buff coloured, those nearest the anal angle being orange; the head and anterior part of the thorax are spotted with white as in *P. Panope*, and the abdominal segments are marked with slender white lines at the sides.

The underside of all the wings is a rich red-brown, with a slight purple tinge seen in certain lights; the fore-wings are immaculate, except a few white scales at the base, of which there are also two patches at the base

* With a lens, a very few luteous scales can be perceived in those parts of the fore-wings near the apical margin, where the cream-coloured row of spots are developed in *P. Panope*.

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of the hind-wings; the latter are marked beneath as above, except that the marginal row of incisures is broad and fulvous, so that each incisure is separated from the white submarginal lunule by a slender black lunule; the spots at the anal angle are united into a fulvous oval spot, with a black rounded spot in its middle; the underside of the thorax is considerably spotted with white, and the abdomen has a row of white spots on each side and down the centre.

Papilio Ramaceus, nov. sp. Pl. V. fig. 3.

P. alis rufo-fuscis, anticis magnis; serie submarginali macularum parvarum albidarum; posticis serie macularum cuneiformum pone cellulam cum serie submarginali lunularum albidarum absque incisuris, albis.

Expans. alar. antic. unc. 3¾.

Habitat in Borneo (D. Lowe). In Muss. Oxon., Hewitson, Druce.

This species (of which I have seen several perfectly similar specimens) has the fore-wings of a comparitively much larger and broader form than *P. Macareus*, to which it is nearly related. The upper side of the wings is of a rich red-brown colour, with a silky gloss; the anterior pair are immaculate, except a submarginal row of small cream coloured spots near the apical margin; the spots next the inner angle being preceded occasionally, as in the specimen figured, by two other still smaller ones; the hind-wings have a row of arrow-head shaped spots, varying somewhat in size, beyond the middle of the wing, preceded by an indistinct spot at the extremity of the discoidal cell, and followed by a submarginal row of whitish lunules extending to the anal angle. On the underside the wings are similarly marked, but the ground-colour of all the wings is very pale brown, and the spots at the inner angle of the fore-wings are extended to the margin; the hind-wings are marked, on the hinder margin, with six very small and narrow white incisures; the body above is black, marked with white dots on the head, and neck, and the sides of the abdomen have a slender white line on each side beneath; the sides of the thorax on the upperside, are destitute of the whitish gray hairs which are so distinct in *P. Macareus*.

The relationship of this form with *P. Macareus*, is indicated by its name being an anagram of the name of that species.

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Papilio Odenatus,* nov. sub-sp. Pl. III. figs. 3, 4.

P. alis anticis brevioribus, posticis ecaudatis, sinuatis, fusco-nigricantibus, fascia maculari communi, albida, in alis anticis fere ad apicem extensa, in posticis subangusta; subtus fusca, fascia ut supra, at in anticis abbreviata, macula alba ad apicem cellulæ discoidalis alteraque ovata subapicali; posticis basi fulvis, nigro-striatis, maculisque duabus subcostalibus nigris, pone fasciam nigro striatis, sinubus marginalibus vix albo-notatis.

Expans. alar. antic. unc. 4.

Hab.—Old Calabar, Muss. Hopeiano Oxoniæ; Ashantee in Mus. Brit.

This species is intermediate between the *P. Zenobia*, of Fabricius, as figured by Donovan (*P. Cypræofila*, of Butler), and *P. Messalina*, Stoll., agreeing with the former in the narrowness and more decidedly marked central fascia of the hind-wings, but differing from it in the almost total obliteration of the white edges to the marginal incisures of the wings, in which latter respect, as well as in the broken, macular fascia of the fore-wings beneath, it more nearly agrees with *Messalina*, from which, however, it differs in the narrow fascia of the hind-wings.

The fore-wings are black-brown, with very minute white incisures, and the hind-wings are similarly coloured, with the incisures distinct, but narrowly white; all the wings are traversed by a cream-coloured fascia, which is macular in the fore-wings, running from rather beyond the middle of the hinder margin towards the apex, and not recurved towards the costa, as in *P. Cypræofila*; it consists, in the fore-wings, of eight spots, of which the first nearest the apex of the wings is of moderate size, elongate-oval, and bifid at its apex, and placed about half-way between the cell and the apex; the second is much smaller elongate-triangular; the third, fourth, fifth, and sixth are of nearly equal size, each rounded within and pointed without; the seventh is the largest, and divided in two by the false fold, and the eighth is narrow, and rests on the hinder margin; the fascia in the hind-wings is entire, running entirely across the wing, half

* I have named this species after the husband of *Zenobia*.

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of the fascia being within, and half beyond the discoidal cell; the inner margin of this fascia is straight, but the outer is acutely dentate, the black part of the wing running upwards very slightly along the veins, whilst the middle of each of the dark spaces intervening between the veins is acutely extended much further upwards or backwards with a sharp defined margin. There are a few scattered whitish scales visible at the extremity of the cell of the fore-wings; on the underside, the second smaller triangular spot of the fascia of the fore-wings is obsolete, and there is a more decided white spot at the extremity of the cell; the base of the hind-wings is dark orange-buff, with black stripes between the veins, there being three within the discoidal cell, of which the middle one is abbreviated; the black mark between the costal and post-costal vein is much the thickest, divided near its base obliquely into two parts; the cream-white fascia of the hind-wings is rather narrower than above, and there is tendency to develop a spot beyond the fascia in the area between the second post-costal branch and the discoidal vein; the spaces between the veins, beyond the fascia, are much more strongly marked with a black longitudinal stripe than on the upper side.

I have named this species, which extends from Old Calabar to Ashanti, after the husband of Zenobia, to express its close affinity with the *Papilio* so named.

Papilio Zenobia.

The insect described by Fabricius, in all his works, under the name of *P. Zenobia*, was stated by him to have been a native of Sierra Leone, and to have been in the collection of Sir J. Banks. In his last work (Ent. Syst. iii. p. 37, repeated on p. 115) he referred the species to Jones, fig. pict. 1, tab. 68. On this drawing, however, Jones refers to the collection of Drury, and not to that of Banks. Donovan (Nat. Repos. 5, pl. 179) figures the same insect as Jones, stating that this is a "splendid *Papilio* represented in the drawings of Mr. Jones, as referred to by Fabricius. Our figure is, however, from the specimen itself, in the cabinet of Sir J. Banks, Bart., and was copied during the life-time, and by the express permission of its very worthy possessor." On comparing Donovan's and Jones' figures, however, it

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is evident that the former is a bad copy of the latter; they both represent the butterfly as measuring about five inches in expanse (nearly an inch wider than the natural size), but Donovan incorrectly represents the fascia of the fore-wings as extending quite to the costal margin, as well as having the anterior spots of the fascia much too elongated, especially that between the two terminal branches of the post-costal vein, which is represented as extending backwards to the cell itself; he has also drawn the small white marginal incisures of the fore-wings at equal intervals apart, whereas, two of them are wanting near the apex of the wing. Mr. Butler (Cat. Lep. D. Fabr. p. 252) states, however, that the type specimen of *P. Zenobia* is in the Banksian collection, and is quite distinct from Donovan's species, the latter being *P. Cyprœofila* (Butler, Ent. Month. Mag. V. p. 60). If this be the case, we must admit that Fabricius incorrectly referred his species to Jones's 'Icones,' and that Donovan's assertion of his drawing having been made from the Banksian type was false. We are thus reduced to the Fabrician description; and I think we must allow that the words "maculis marginalibus albis" can only be intended for the insect figured by Donovan and Jones; the "fascia interrupta nec marginem attingit" in the fore-wings, although not inapplicable to the insect figured by Donovan, would agree better with Stoll's figure of *Messalina*, (pl. xxvi. f. 2), which Mr. Butler regards as the true *P. Zenobia*, agreeing with the insect in the Banksian cabinet; whilst the words "subtus concolores at posticæ basi flavæ nervis striisque atris" agree better with the insect figured by Jones and Donovan, than with Stoll's *P. Messalina*, or even *P. Odenatus*, in which the black mark towards the costa of the base of the hind-wings is divided into two thick spots, which Fabricius would hardly have called a stria; in fact, the description which he has given of his next species, *P. Cynorta*, which has the hind-wings, beneath, marked as in Stoll's *Messalina*, shows how completely he appreciated this character, "affinis omnino præcedenti (*Zenobia*) paullo minor et maculæ marginales albæ desunt at basis flava, alæ posticæ punctis tribus distinctis nigris;" "posticis basi flavis nigro punctatis striatisque." Under these circumstances, I am induced to retain the name of *P. Zenobia* for the insect figured by Donovan, and to apply that of *P. Messalina* to Stoll's insect, which Mr. Butler regards as the true *Zenobia*.

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Papilio Parsedon, nov. sp. Pl. V. figs. 1, 2.

P. alis nigro-fuscis, fascia communi albida, ad marginem internum anticarum sensim et ad costam posticarum valde, dilatata, punctis tribus parvis rotundatis subapicalibus in anticis et serie lunularum 5 ante marginem posticam in posticis ejusdem coloris; alis posticis subcaudatis subtus litura basali et 5 lituris pone fasciam rubris, angulo anali absque ocello.

Expans. alar. antic. unc. 2¼.

Habitat ———? In Mus. Druce (E Mus. Kaden absque patriæ indicatione).

The unique specimen of this sub-species is unfortunately without any indication of its locality. It is evidently a localized form of *P. Sarpedon*, remarkable for its small size, the more pointed tail, and the remarkable width of the pale fascia (common to both wings) where the anterior and posterior wings come in contact; the specimen is a male, with very long white hairs along the anal margin of the hind-wings. The specimen is quite fresh, and there seems no reason to suppose that the fasciæ and marks on the wings were ever of a green colour, or in fact, different from their present pale straw colour, very slightly tinged in certain points of view with green. The veins in the broad part of the fascia, in both wings, are very pale straw colour. There is a very small concolorous spot on the inner margin of the hind-wings, near the extremity of the fascia; the pale lunules near the outer margin of the hind-wings are small and narrow, especially the three outer ones. The markings on the underside of the wings are the same as above, except that the submarginal lunules of the hind-wings are suffused with brown scales, and are preceded by a series of five narrow red marks, the innermost of which is in contact with the extremity of the inner margin of the fascia of the hind-wings. In both fore-wings, the membrane between the base of the second and third branches of the median vein, is marked with a dark curved line, inclosing a somewhat triangular space.

The relationship of this form to *P. Sarpedon* is indicated by its name being an anagram of that name.

The nearest approach to this form is made by certain New Holland individuals of *P. Sarpedon*, one of which I

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figured in the coloured plate of butterflies, in 'Partington's Cyclopædia of Natural History,' in which the green band is much dilated in the middle. In the Oxford Museum there are the following localized forms of *Sarpedon*.

From Assam. Hind-wings with the tooth at the extremity of the third branch of the median vein not extending beyond that of the second branch; green fascia on fore-wings, moderately divided by black veins; lunules of hind-wings narrow. Specimens from China nearly agree with the preceding, but the fascia in the fore-wings is somewhat more macular, and in the hind-wings scarcely extending beyond the discoidal cell towards the anal margin.

From Cuna (East Indies). Similar to the Assam specimens, but the hind-wings much more elongated, the third branch of the median vein produced into a long tooth, the part of the median vein crossing the green bar of the hind-wings thick and black. Specimens from Aru are nearly similar.

From New Holland. With the green fascia gradually becoming very broad at the inner margin of the fore-wings, and the costal margin of the hind-wings.

From Celebes (*P. Miletus*, Wallace, Linn. Trans. XXV. p. 65, pl. vii. f. 2; *P. Milon*, Felder). Fore-wings much elongated, and acute at the tips, with the costal margin more arched; the green fascia in these wings of a bluer colour, very narrow, and separated by the black veins into distinct spots; hind-wings with the tail scarcely produced, with the green submarginal lunules of large size, and strongly angulated in the middle.

From Ceram (in Mus. Hewitson). Differs from the Celebes type in the fore-wings being of the ordinary form, with the green band wider, traversed only by the black veins (as in the Continental types), and the hind-wings formed as in the Celebes type (both in shape and in the extent of the tail), with the green band broader in the discoidal cell, the four green submarginal lunules very strongly marked, and with a clear slender acute lunule between the innermost lunule and the anal angle.

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Papilio Burchellanus, nov. sp. Pl. III. fig. 5.

P. alis anticis magnis, latis et ovalibus; posticis mediocribus, sinuatis: omnibus fuscis, posticis dimidio apicali nigricanti, incisuris albis, serie macularum 6 punicearum parvarum, interna duplicata, ante marginem apicalem posita; collari rufo-binotato, lateribusque thoracis sub basin alarum rufo-maculatis.

Expans. alar. unc. 4 lin. 1.

Habitat in Brasilia, taken at Tenénte, near Fárinha-pódre (D. Burchell). In Mus. Oxoniæ.

This species is nearest allied to the Brazilian *P. Pompeius*, *Proteus*, and especially to *Panthonus*, ♀, from which it differs in the very large size of the fore-wings, which imparts to it a certain degree of resemblance to some of the broad-winged species of *Euplœa*.

The unique specimen collected by Dr. Burchell appears to be a female, and in both of the hind-wings the extremity of the second branch of the median vein is mutilated, so that it might possibly be inferred that the species was a tailed one, but for the circumstance that, in the Papilionidæ, it is the third branch of the median vein which is extended into the tail. The discoidal cell of the hind-wing terminates in an acute angle; the third branch of the median vein arising at the apex of the angle, the space between the second and third branches of the median vein being almost precisely of equal length with the lower disco-cellular.

The last-mentioned character, together with the large immaculate fore-wings, will distinguish this insect from the great mass of black South American Papilios with red spots on the hind-wings.

Papilio Chiansiades, nov. sp. Pl. V. figs. 4, 5.

P. alis supra nigricantibus incisuris albis; anticis macula magna albida in medio marginis interni; posticis maculis tribus sanguineis prope angulum ani, anali late, proxima anguste bipartita, 3tia rotundata; posticis subtus serie 7 macularum rubrarum submarginalium, majoribus tribus internis albo supra irroratis, duabusque internis maculis duabus rubris supra adjunctis; thorace infra fulvo-rufo-maculato (♂).

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Expans. alar. antic. unc. 4⅛.

Habitat Rio Topo, Ecuador (Buckley). In Muss. Druce et Hewitson.

The fore-wings are elongate-triangular, with the apical margin slightly emarginate, the incisures towards the inner angle narrowly white. They are of a black-brown colour, with a large, nearly semicircular, patch of luteous white in the middle of the hinder margin, extending nearly to the first branch of the median vein. The hind-wings are deeply incised along the outer margin, the middle point being somewhat the most prominent; the incisures white; there is a large transverse, oval, blood-red patch, irrorated with black scales, extending inward from the anal angle, composed of three patches separated by the veins, the one at the anal angle being widely divided into two portions, and the next also divided by a thinner transverse dark line into two portions, whilst the innermost spot is roundly oval and entire.

On the underside, the spot on the inner margin of the fore-wings is smaller than above, and the red spots of the upper side reappear, the larger ones irrorated above with white scales, and supplemented by a row of four submarginal red spots, extending to the outer angle.

The collar above is obscurely marked with two fulvous spots, and the head with four white ones; the underside of the thorax is also marked with fulvous-red spots on each side.

In the males of *P. Anchisiades*, the fore-wings are more falcate at the tip, and the few pale scales (when present) are placed near the posterior angle of the fore-wings; in the hind-wings, the red patch is larger and oval, the portion between the first and second branches of the median vein being entire, and the two external portions bipartite.

In the females of *P. Anchisiades*, the pale patch in the fore-wings is larger, more oval in shape, and does not extend between the postmedian vein and the inner margin of the wing.

P. Evander, Godt. (*Idæus*, Fab.) has the pale apical half of the fore-wings, suddenly separated from the dark base and the red spots of the hind-wings, both in the males and females, as strongly marked as in *P. Anchisiades;* the fore-wings in the female being destitute of the pale discoidal spot.

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In *P. Orchamus*, the fore-wings are much shorter, and broadly triangular, with an oblique abbreviated fascia extending across and below the extremity of the discoidal cell, and the red patch of the hind-wing is of larger size and ovate, extending into the extremity of the discoidal cell, the outer and inner portion being marked by a black spot.

P. Polybius and *P. Caudius* have elongated narrow tails.

Papilio (*Euryades*) *Reevii*, nov sp.

P. alis supra obscure fulvis, subtus pallidioribus et magis stramineis; anticis macula subapicali flavescenti, margine nigro, maculis marginalibus flavidis; posticis dimidio postico supra fusco, subtus nigro, serie duplici macularum, rubrarum alterâque macularum majorium, supra lutearum, subtus straminearum, interpositâ; margine sinuato, incisuris albis, et 1-caudato.

Expans. alar. antic. unc. 3½.

Hab.—Buenos Ayres (J. W. Reeve). Mus. Druce.

The only specimen of this very interesting butterfly which I have seen, is contained in the rich collection of Mr. Druce, who has kindly allowed me to describe it, and who has suggested the specific name adopted above, in honour of the captor of the insect.*

In proposing for it, however, a distinct specific name, in the uncertainty which (as a unique specimen) rests upon its sexual relationship, I must suggest the possibility of its being the opposite sex of *Papilio Duponchelii* of Lucas (Ann. Soc. Ent. France, tom. 8, pl. viii. p. 91), an insect which its describer considered to be most nearly allied to *P. Grayi* and *Scamander*, from Entre Rios, between Parana and Uruguay, of the sex of the typical specimen of which there appears to me also to be some doubt. This is a black-winged butterfly, having a broken macular yellow fascia on the fore-wings, extending into a large discoidal yellow spot on the hind-wings, followed by two rows of small round scarlet spots, yellow marginal incisures, and a single tail. Of this insect M. Lucas expressly says "Fœminam tantum novi." Dr.

* Figures of Mr. Druce's specimen will appear in my forthcoming 'Thesaurus Entomologicus.' Pl. XXXIII. fig. 1, 2.

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Felder (Sp. Lep., pp. 39, 88) has placed *P. Duponchelii* in the genus *Euryades*, adding, as a second species, the *Papilio Corethrus*, of Lacordaire and Boisduval (Sp. Gen. Lepid. I. p. 314, pl. 17, 1c, fig. 2; Lucas, in Chenu's Encycl. d'Hist. Nat. Lep. t. 9. f. 1), and remarking on its close relationship to the genus *Eurycus*.

Now, the females of *P. Corethrus*, as stated by the late Edward Doubleday (Gen. D. L. p. 21), from information which I communicated to him, have a large horny pouch on the underside of the extremity of the body, as in the genera *Eurycus* and *Parnassius*, but of this structure no mention is made by M. Lucas in his description of the supposed female *P. Duponchelii*. The wings in *P. Corethrus* are, also, not so densely clothed with scales as in the ordinary species of *Papilio;* they are quite alike in colour and marking in both sexes, the male external organs resembling those of *Eurycus*.

The remarkable diversity in the sexes of *Eurycus*, the male being black and white, with a row of blood-red spots on the hind-wings, whilst the female is semi-transparent, dull buff varied with brown, suggests to my mind the possibility that the black, yellow, and red butterfly, figured by M. Lucas under the name of *P. Duponchelii*, may be a male, the true female of which will probably prove to be a pale coloured, semi-transparent butterfly, analogous to that of *Eurycus;* in which case, it seems to me to be not improbable, that *P. Reevii* may prove to be its female. In the meantime, until I have an opportunity of examining the structure of *P. Duponchelii*, it will be desirable to consider *P. Reevii* as a distinct species.*

Papilio Thersander.

Under this name, a species of swallow-tailed butterflies was described by Fabricius, in his 'Ent. Syst.,' vol. 3, pt. 1, p. 32, with the reference to Jones, fig. pict. vol. i. tab. 71, and to the collection of Drury, as a native of Sierra Leone. This insect is now regarded as the female of the well-known *P. Doreus*, Fabr. Syst. Ent. p. 457, and Ent. Syst. vol. 3, pt. i. p. 68 (*Phoreas*, Cram. pl. 2, figs. B, C).

* Since the above observations were written, it has been announced that M. Guenée has communicated a memoir on *P. Duponchelii* to the Academy of Lyons, to the publication of which we look forward with great interest.

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About the year 1840,* the famous collection of drawings made by Mr. Jones, was deposited for a short time at the British Museum, where I had the opportunity of studying the species of *Papilionidæ* which it contained, and of which I made considerable use in my 'Arcana Entomologica,' 1841-1845. The figures in these drawings of *P. Thersander* were very accurate ones, representing a moderate-sized true *Papilio*, from Drury's collection, marked as a native of Sierra Leone, with brown wings, having, on the upper side, a cream-coloured fascia extending across them, being macular on the fore-wings, and placed beyond the discoidal cell, but entire in the hind-wings, and not extending beyond the discoidal cell; between the fascia and the apical margin of the fore-wings is a small subapical spot, and a lower row of four small submarginal spots, each divided by the longitudinal fold between the branches of the veins, the four middle incisures of the fore-wings are cream-coloured, and the one next the anal angle is larger and triangular; the hind-wings have a submarginal row of cream-coloured spots, mostly divided by the folds between the longitudinal veins; the incisures are of the same colour, and the spatulated tail is marked on each edge with a similar coloured marginal spot.

The examination which I was thus enabled to make, enabled me to determine that a specimen of a *Papilio*, at that time unnamed in the collection of the Bristol Institution, forwarded to me by the care of the late W. Raddon, Esq., and one in the British Museum, were identical with a Fabrician and Jonesian butterfly, and I accordingly figured both sides of the former specimen in my 'Arcana Entomologica,' vol. I. p. 148, pl. xxxviii. figs. 1, 2, under the name of *P. Thersander*, with a statement of the means by which I had arrived at the identification of the species, and with the following additional observations:—"This is the more necessary to be stated because Donovan, in his 'Naturalist's Repository,' vol.

* At the present time (1871), the seven large quarto volumes, into which this collection of drawings is bound, belong to the family of F. Dawtrey Drewitt, Esq., of Christ Church, Oxford, and Burnham, Arundel, a gentleman of great artistic promise, who proposes to publish the unfigured and doubtful species represented therein, and who has allowed me to make a very careful collation of the entire collection.

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III. pl. lxxv., figured the upper and under side of a totally different insect, under the name of *P. Thersander*, and which he says were copied from Jones's figures. *If not artificial*, they, however, represent one of the *Nymphalidæ* (*Charaxes* sp.), as is evident from the head and antennæ. There are, however, no such figures in Jones's 'Icones:' so that *Donovan must have fallen into some strange error respecting the species.*"

Now, Donovan's figures represent a butterfly brown on the upper side, with a macular yellow fascia on the fore-wings, extending nearly to the tip of the wings, preceded by a yellow spot in the discoidal cell, and another in the costal margin, near the middle of the wing, and followed by a submarginal line of yellow linear transverse marks, and rather large yellow incisures; the hind-wing traversed by an entire yellow band with irregular margins, followed by a double row of submarginal spots, large yellow incisures, and a single spatulate tail with yellow edges; the underside is of a lilac colour, the basal half with dark undulating *transverse* lines (intended to represent the *longitudinally* "nigro lineatæ" of the Fabrician description of the hind-wings), an entire yellow central fascia extending across all the wings obliquely, followed by two irregular series of lunules, of which the outer consists of seven white ones corresponding with the "denique lunulæ septem albæ" of the Fabrician description. With these figures, so completely at variance with those of Mr. Jones's 'Icones,' Donovan published the following observations:—"The experienced entomologist, conversant with the labours of Fabricius, will be best enabled to appreciate the importance of the plate which we now submit to his attention; he will be aware of the existence of this fine species of the *Papilio* tribe from the description which Fabricius has left us; and he will also know that it is only from that description, with the additional aid of Mr. Jones's drawings, that this interesting and conspicuous species can be at this time possibly ascertained, for there are no descriptions of the species extant, except those repeated from the writings of Fabricius, nor any figure excepting that in the collectanea of Mr. Jones's drawings, to which Fabricius exclusively refers. After having advanced the preceding observations, it will be assuredly sufficient for us, in order to ensure the attention of the entomologist, to

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observe that, although we possess a very choice example of this elegant insect in our own cabinet, *the figures in the annexed plate are faithful copies* of the individual drawings in the collection of Mr. Jones, to which Fabricius has referred; and we conceive we render some advantage at least to science, in thus enabling the naturalist to identify this fine and very interesting species in the classical work of that estimable entomologist, who has alone described it."

The attempt to unravel the real history of these figures is worthy our attention, by letting us into the secret of Donovan's mode of preparing such of the plates of his illustrated works as represent those Fabrician butterflies which had been described only from Jones's 'Icones.' Mr. Jones lived at Chelsea, and Donovan, as an excellent artist, engaged in publishing various illustrated works on the science, was allowed unlimited use of these drawings; and his general plan was to copy, in strong body water-colours, the upper-surface of the two wings on one side of the species, adding marginal notes of the differences exhibited by the under-surface of the same wings; and it is from these notes, and not from direct copies of Jones's drawings, that many of the undersides of Donovan's figures were published. Donovan's set of copies, thus made, were subsequently purchased by the Rev. F. W. Hope, who added them to his entomological library, presented, as is well known, with his collections, to the University of Oxford, and now under my charge. From these it is evident that Donovan was a careless person, his drawings having been kept in a very dirty condition.

Now it happens that Donovan's copy of the figure of the upper-surface of *P. Thersander* had been grievously mutilated (it appears as though it, as well as some other of his copies, had been gnawed by mice), half of the costal portion and part of the apical portion of the fore-wings, and half the base, including the pale fascia, and the whole of the anal margin of the hind-wings have disappeared. The fragments were put together by Donovan, and mounted on a sheet of thick whitey-brown paper, on which Mr. Hope wrote, "put together by Donovan to settle some dispute." Moreover, a portion of the end of each line of the note of description of the underside has been lost, and, consequently, did not afford Donovan sufficient material to manufacture a figure of the under-

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side. To do this, he had recourse to collections, and finding in one of the varieties of *Nymphalis* (*Charaxes*) *Fabius* (var. *Hannibal*), a dark brown butterfly with a macular pale fascia on the fore-wings, and an entire one on the hind-wings, he (regardless of the variation in the arrangement of the fore-wing veins and peculiar shaped tail to the hind-wing, still visible in his tattered fragments), compounded a figure of the upper surface, in which he introduced a spot within the discoidal cell, and another in the middle of the costa of the fore-wings, of which there are no traces given in his own fragments, and converted the two short acute tails of the *Charaxes* into the spatulate one of *P. Thersander*, adding a red lunule on a yellow ground at the anal angle, whilst, as his notes of the under-surface of *P. Thersander* had been partially destroyed, he was obliged to depend entirely on his specimen of the *Charaxes*, which does not bear the slightest resemblance to that of *P. Thersander*.

By way of confirming the above statements, and of shewing the manner in which some of Donovan's figures were manufactured, I add the following notes on two other species of butterflies.

Euplœa Sylvester.

In the 'Naturalist's Repository,' vol. iv. p. 120, is published a tolerably correct copy of the upperside of this species, from Jones (omitting the white dots on the head and thorax, and making the middle spot on the costa of the fore-wings transverse instead of oblique) whilst the underside is represented uniformly brown, with the exception of three small white dots beyond the middle of the fore-wings, and a submarginal series of ten minute white spots in the fore, and of fourteen similar close to the outer margin of the hind-wings. Jones's figure, however, of the underside, represents the hind-wing as marked with the same broad white macular band as the upperside, preceded by one small white spot within the discoidal cell, followed by a curved row of seven small spots, close to the inner edge of the white fascia, which is followed by a submarginal row of twelve small dots, of which there are only six in the fore-wings. On referring to Donovan's copies from Jones, we find the upper surface alone represented, but on the brown ground of the wings are to be seen several small black dots, with the marginal note:

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"These black dots are not seen, but only denote" . . . (here torn, but meaning the white dots which Donovan introduced into his published figure, and which he evidently supposed in 1825, when he published his plate, were the only markings in the under-surface of the wings.

Again, in the 'Mantissa Insectorum,' and Ent. Syst. iii. p. 260, Fabricius described—

THECLA TIMON,

with the "Habitat in America, meridionali, Mus. Dr. Hunter." The description, which is identical in the two works, is very clear; "alis—subtus albis; posticis fascia abbreviata sanguinea."—In Jones's 'Icones,' vol. v. pl. i. fig. 2, 2a, a large species of *Thecla* was represented as *P. Timon*, with a reference to the collection of "Drury," from "Amer. meridion." It happens, however, that we are able to state, that this species figured by Jones was not recognized by Fabricius, as having been described by himself; for at the commencement of this fifth volume of Jones's 'Icones,' is a manuscript of such of the species as had been described *by Fabricius in his own handwriting*, as we learn by Mr. Jones's note, "This is Mr. Fabricius's own writing, the names given and corrected by himself;" and in this list neither of the species represented in pl. I. are referred to. Donovan, however, with his usual boldness, affirms of the figures which he published in the 'Naturalist's Repository,' vol. III. pl. xcvii., copied from Jones's figures:—

"*Papilio Timon* is another of those choice examples of the *Papilio* tribe, for the description of which we are indebted solely to Fabricius, and for the illustration of the species in the inestimable drawings of Mr. Jones. The species is a native of South America, and was originally preserved in the cabinet of Mr. Drury; subsequently this rarity came into our own possession. Fabricius refers for the specimen he describes, to the cabinet of Dr. Hunter, in which there may perhaps be other examples of the same insect; but we are *well assured from the Fabrician MS.*, that the description of the species which he has left us, was taken from the drawings in the collection of Mr. Jones, and that this drawing was copied from the specimen in the cabinet of Mr. Drury, to which we have adverted."

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It will be seen from the preceding observations that, whilst the last statement is quite correct, the preceding one is false, the description having been made from a specimen in the Hunterian collection, which disagrees with that figured by Jones and copied by Donovan, in having a reddish stripe running across all the wings on the underside. The real type of *Th. Timon* is still preserved in the Hunterian Museum at Glasgow, and Mr. Butler has been enabled to give a detailed description of it (Cat. Fabr. Diurn. Lep., p. 183).

Explanation of the Plates.

Plate III.

Fig. 1. *Papilio Buddha*, p. 86.
2. *Papilio Papone*, p. 94.
3. *Papilio Odenatus*, underside, p. 96.
4. „ „ upperside.
5. *Papilio Burchellanus*, p. 101.

Plate IV.

Fig. 1. *Papilio Nox*, male.
2. *Papilio Noctis*, male.
3. *Papilio Noctula*, male, p. 90.
4. *Papilio Strix*, female underside, p. 92.
5. *Papilio Noctis*, female underside.

Plate V.

Fig. 1. *Papilio Parsedon*, upperside, p. 59.
2. „ „ underside.
3. *Papilio Ramaceus*, p. 95.
4. *Papilio Chiansiades*, upperside, p. 101.
5. „ „ underside.

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VI. *Notes on the* Diurnal Lepidoptera *described by* Jablonsky *and* Herbst, *in their "Naturesystem aller bekannten Insekten."* By W. F. Kirby, Assistant in the Museum of the Royal Dublin Society.

[Read 4th March, 1872.]

This work seems to be little known to entomologists, except by name; but as it contains several new species and corrections of synonymy, a few notes may not be uninteresting. By far the largest number of species figured, are copied from Cramer, Esper, Drury, &c., and hence the five per cent, or so, of new species, &c., have not unnaturally been overlooked.

Vol. 1. By Jablonsky, 1782.

9. Pap. Pandarus, Jabl., p. 209, t. 6, f. 1.

This species, the *Pseudopandarus* of Esper, is universally considered to be a fabrication.

Vol. 2. By Jablonsky, 1784.

32. Pap. Phorbanta, L., p. 125, t. 12, f. 3.

The first figure of this species in any systematic work. It is copied from D'Aubenton.

51. Pap. Pelaus (?), F., p. 265, t. 19, f. 1.

Pap. Peleides, Esp. Boisduval doubts the existence of this species.

Vol. 3. By Herbst, 1788.

99. Pap. Miltiades, p. 154, t. 44, f. 1, 2.

This species, copied from D'Aubenton, is, as Doubleday remarks, a compound of the fore-wings of *P. Erithonius* and the hind-wings of *P. Ajax*.

116. Pap. Pompilius, F., p. 205, t. 49, f. 5, 6.

Pap. Policenes, Cr., is figured under this name. *Pap. Pompilius*, F., is a somewhat doubtful species.

124. Pap. Crithon, p. 228, t. 52, f. 5, 6.

Pap. (*Megalura*) *Crethon*, Fabr. The only existing figure of this species.

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Vol. 4. By Herbst, 1790.

154. Pap. Cajus, p. 65, t. 64, f. 1, 2.

Pap. Brutus, Cr., *nec* Fabr.; *Charaxes Brutus*, auct. If the Fabrician species has the priority, Herbst's name should probably stand. It is, however, a dubious point, whether a name altered on the ground of *double emploi*, and since overlooked, should afterwards be restored, when no confusion between the two names is any longer possible.

159. Pap. Atticus, p. 75.

Pap. Empedocles, F., *nec* Cr. Here again Herbst's name should, perhaps, supplant that of Fabricius.

28. Pap. Carolina, p. 131, t. 72, f. 2.

An undetermined species of *Migonitis*.

40. Pap. Myrti, F., p. 150, t. 74, f. 5.

Under this name, Herbst figures *Pap. Erycinia*, Cr. (*Archonias Bellona*, Cr. ♀); *Pap. Myrti*, Fab. is however = *Migonitis Ricini*, L. (Crotch having shown that the true type of *Heliconius* is *Psidii*, L., the genus which has hitherto usurped that name must be called *Migonitis*, H.).

46. Pap. Hecale, F., p. 161, t. 76, f. 1.

Herbst rightly figures *Migonitis Pasithoe*, Houtt., Cr. under this name. It is very doubtful whether the Fabrician name ought not to stand for this species, as it was first figured by Houttuyn, "Nat. Hist.," t. 1, par. 11, p. 231, pl. 88, f. 2, by mistake for *Delias Pasithoe*, L.

Vol. 5. By Herbst, 1792.

1. Pap. Rudolphina, p. 7, t. 81, f. 1, 2.

Cramer figured two species, a *Melinæa*, and an *Acræa*, under the name *Egina*. Stoll refigured the former on a subsequent plate, as *Ludovica*, which name should perhaps be accepted; Herbst renames the *Acræa*, to which the name *Egina* belongs by priority, *Pap. Rudolphina*.

11. Pap. Karschina, p. 26, t. 83, f. 5, 6.

Herbst employs this name for *Euritea*, Dru., *nec* Cr., and his name must stand. It has since been twice renamed; and is inserted in my catalogue as *Melinæa Gazoria*, Godt.

12. Pap. Unzerina, p. 27, t. 83, f. 7.

Herbst erroneously adopts this name for *Ithomia diaphanus*, Dr., in consequence of Stoll and Cramer having

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subsequently figured another species (*I. Drymo*, Hübn.) as *diaphana*.

17. Pap. Anacardii, p. 34, t. 84, f. 8.

Under this name, Herbst copies Merian's figure of *Hætera Piera*, L.

9. Pap. Minna, p. 74, t. 89, f. 1, 2.

Catopsilia Pyranthe, var.

10. Pap. Lina, p. 75, t. 89, f. 3, 4.

A species of *Dismorphia*, closely allied to *D. Licinia*, Cr.

13. Pap. Argia, F., p. 78, t. 90, f. 1.

Eronia Argia. Herbst copies Cramer's figure (*Cassiopea*, Cr., 201 A), and is the first author who figures the species under the Fabrician name.

32. Pap. Aurora, Cr., p. 103, t. 94, f. 5, 6.

33. Pap. Meta, p. 104, t. 94, f. 7-9.

35. Pap. Eucharis, F., p. 107, t. 95, f. 5-8.

Callosune Aurora, Cr. (or rather Stoll), is usually regarded as synonymous with *Eucharis*, F. Herbst considers Stoll's figures of the ♀ to represent the ♂ of another species, which he calls *Meta;* and he figures as its ♀ an insect perfectly similar, but with white instead of orange spots at the tip of the fore-wings. As *Pap. Eucharis*, F., he copies Stoll's figures of *Eborea*, ♂, which = *C. Danae*, F., and not *Eucharis*. I cannot satisfy myself that Donovan's figure of *Eucharis*, F. (Ins. Ind. t. 27, f. 4), although undoubtedly very bad, really represents the same insect as *Aurora*, St.

48. Pap. Antonoe, p. 126, t. 100, f. 1-4.

Herbst adopts this name for *Hyparete*, Cr. & St. = *Delias Cœneus*, L.

51. Pap. Hyparethe, L., p. 131, t. 101, f. 3-7.

Under this name Herbst has mixed together the figures of Cramer and Drury, representing *Delias Hyparete*, L., and *D. Eucharis*, Dr., *nec* F. The name *Eucharis* having been used by Drury before Fabricius, the Fabrician *Eucharis* mentioned above should retain the name *Aurora*.

70. Pap. Merula, p. 158.

Herbst adopts this name (wrongly in any case) for the fictitious *Pap. Ecclipsis*, L.

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74. Pap. Lalage, p. 163, t. 106, f. 1, 2.
Catopsilia Crocale, ♂, Cr.

82. Pap. Hecabe, L., p. 171, t. 106, f. 3-5.
Herbst's figure of the ♂ evidently represents another species.

87. Pap. Hanna, p. 177, t. 107, f. 5, 6.
This name must take precedence of *Callosune Cebrene*, Boisd., for *Pap. Arethusa*, Cr. *nec* Dru.

88. Pap. Ænippe, Cr., p. 178, t. 107, f. 7, 8; t. 108, f. 1, 2.
Herbst refers to this species Cramer's figures 105, C. D., and 157, C. D.

90. Pap. Ulrica, p. 182, t. 108, f. 9, 10.
Herbst proposes this name for *Pap.* (*Ixias*) *Ænippe*, Cr., 229, B. C., *nec* 105, C. D.

91. Pap. Sesia, F., p. 183, t. 109, f. 1-4.
Under this name Herbst figures *Pap. Pyrene*, Cr., 125, A. B., and *Pap. Evippe*, Dru.

116, 118, 119. Pap. Hyale, Palæno, and Europome.
I merely mention these species to remark that the first is the true *Hyale*, L.; the second, *sareptensis*, Staud.; and the last the true *Palæno*, L.

117. Pap. Heos, p. 213, t. 114, f. 5, 6.
Herbst rightly changes the name of *Colias Aurora*, Esp., *nec Aurora*, Stoll.

Vol. 6. By Herbst, 1793.

3. Pap. Superbus, p. 14, t. 119, f. 3; t. 120, f. 1, 2.
A well-known species of *Euplœa*.

5. Pap. Claudius, F., p. 17, t. 120, f. 5.
Herbst first figures *Pap. Midamus*, L. (♀) under this name.

74. Pap. Cicero, p. 130, t. 146, f. 3, 4.
Euthalia Evelina, Stoll.

81. Pap. Aconthea, Cr., p. 143, t. 149, f. 1-4.
Herbst quotes *Pap. Melissa*, F., which is probably a species of *Œneis*, as a synonym of this.

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Vol. 7. By Herbst, 1794.

15. Pap. Pulsius, p. 83, t. 165, f. 6, 7.

Herbst would have done right in thus renaming Drury's *Rumina*, if this species were not synonymous with *Axiocerces Thero*, L.

28. Pap. Trullus, p. 108, t. 169, f. 6, 7.

Herbst has thus renamed *Precis Pelarga*, F., without stating his reasons.

29. Pap. Cortinna, p. 110, t. 181, f. 1, 2.

Pap. Merione, Cr., is thus renamed, although it is prior to *Pap. Merione*, F.

64. Pap. Atalanta, L., p. 171, t. 180, f. 1-6.

Herbst calls figs. 1 & 2 *Atalanta Indica* on his plate. The insect thus named is *Calliroë*, Hübn.

Vol. 8. By Herbst, 1796.

67. Pap. Zitenius, p. 5, t. 182, f. 1, 2.

Melanitis Vamana, Moore, is the ♂ of this species.

[The writings of Latreille prove *undularis* to be the true type of *Melanitis*, and hence *Leda* and allies must be referred to the genus *Hipio*, Hübn.].

2. Pap. Suwarovius, p. 13, t. 182, f. 5-7.

Pap. Arge Russiæ, Esp.

3. Pap. Syllius, p. 15, t. 182, f. 8, 9.

I am unable to state with certainty, whether this name has the priority over Esper's *Pap. Arge Occitanica*. It certainly has over *Pap. Psyche*, Hübn.

6. Pap. Procida, p. 22, t. 183, f. 5, 6.

The common Italian form of *Melanargia Galathea*.

22. Pap. Hannibal, p. 48, t. 188, f. 5-8.

Herbst adopts this name (in the text only) for *Cœnonympha Dorus*, Esp., apparently on account of there being more than one *Doris* already.

36. Pap. Hamilcar, p. 73, t. 193, f. 3.

Herbst rightly adopts another name for *Pap. Doris*, Cr. & St. (*nec* L.), but the species is now referred to *Mycalesis Medus*, F.

40. Pap. Eustachius, p. 77, t. 193, f. 8, 9.

Euselasia Mys, H.-S.

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53. Pap. Mineus, L., p. 92, t. 196, f. 1, 2.

Mycalesis Drusia, Cr., is figured as *Mineus*, L.

60. Pap. Iphigenus, p. 108, t. 198, f. 5-8.

A variety of *Cœnonympha Œdipus*, F., figured by Esper (subsequently to Herbst?) under the name of *Geticus*.

67. Pap. Hippolytus, p. 126, t. 201, f. 3, 4.

Hipparchia Proserpina, Cyr. (*vide infra*) figured by Esper, t. 83, fig. 4, as *Pap. Actæa*, var.

74. Pap. Tyndarellus, p. 135, t. 202, f. 5, 6.

I know not why Herbst changed the name of *Erebia Tyndarus*, Esp.; but he alters the terminations of many other names, as Hübner, Godart, and other authors, have done after him. I have not retained the name *Maniola*, Schr., for *Erebia*, as according to Mr. Crotch's views, *Satyrus*, F., would take priority over *Maniola* in the broad sense; and as Meigen did not materially restrict the application of *Maniola*, that name can only be retained, if at all, for *Dejanira*, L., which Von Heinemann places in a genus by itself, adopting Schrank's *Maniola* for it.

99. Pap. Cyrillus, p. 165, t. 206. f. 1, 2.

Herbst thus changes the name of *Hipparchia Proserpina*, Cyr., on account of its clashing with that of Denis and Schiffermüller, which, however, is a synonym of *Circe*, F. In any case *Ferula*, F., would take precedence of Herbst's name; but in all probability Cyrilli's insect is only one of the numerous forms of *Actæa*, Esp.

104. Pap. Medea, p. 177, t. 208, f. 3, 4.

106. Pap. Medusa, p. 182, t. 209, f. 1, 2.

107. Pap. Æthiops, p. 184, t. 209, f. 3, 4.

Herbst has sadly confused these species. His *Medea* = *Erebia Medusa*, W. V., and the two other species represent the sexes of *E. Æthiops*, Esp.

138. Pap. Maccabæus, p. 185, t. 209, f. 5, 6.

This species, though stated to come from India, is probably a variety of *Erebia Pyrrha* or *E. Melampus*.

112. Pap. Melas, p. 191, t. 210, f. 4-7.

Erebia Melas, Auct.

151. Pap. Cortes, p. 260, t. 225, f. 3, 4.

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Herbst thus renames *Junonia Lavinia*, Cr., on account of the nearly contemporaneous *Pap. Lavinia*, F., which = *Victorina Steneles*, var.

154. Pap. Claudia, p. 264, t. 226, f. 3, 4.

Copied from Schulzen's figures of *Agrias Claudia* in the 'Naturforscher.'

157. Pap. Iris, L., p. 268, t. 226, f. 5, 6; t. 227, f. 1, 2.

The first figures represent *A. Ilia*, ♂; the second (given as *A. Iris*, ♀) the true male of *A. Iris*.

Vol. 9. By Herbst, 1798.

9. Pap. Nina, p. 30, t. 233, f. 1, 2.

Closely allied to, if not identical with, *Mesosemia formosa*, Hew.

49. Pap. Apollinus, p. 156, t. 250, f. 5-8.

Copied from Engramelle, and properly named for the first time.

11. Pap. Daunius, p. 184, t. 256, f. 1, 2.

Euptoieta Hegesia, ♀, Cr.

12. Pap. Laudonius, p. 186, t. 256, f. 3, 4.

Not distinct from *Atella Phalanta*, Dr., figured on the same plate.

14. Pap. Clausius, p. 189, t. 257, f. 3, 4.

Euptoieta Claudia, Cr. Name changed on account of *Agrias Claudia*, Schulz.

16. Pap. Gœtzius, p. 193, t. 258, f. 1-4.

Hypanis Ilithyia, Dr., var. *Polinice*, Stoll in Cram. The name is changed because Cramer is said to have previously employed it for another species; but this seems to be a mistake.

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39. Pap. Fingal, p. 92, t. 270, f. 1-3.

A Scandinavian form of *Argynnis Euphrosyne* = *Dia Lapponica*, Esp., t. 108, f. 5.

40. Pap. Ossianus, p. 98, t. 270, f. 4, 5.

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41. Pap. Tomyris, p. 102, t. 270, f. 6, 7.

Both these are forms of *Argynnis Aphirape*, Hübn.

42. Pap. Marphisa, p. 105, t. 270, f. 8, 9.

Pap. Arsilache, Hübn., Beitr. I. t. 1, f. A, a, b; *Pap. Cybele*, Hübn., *l. c.* text p. 7, = *Argynnis Selene*, var.

43. Pap. Rinaldus, p. 108, t. 271, f. 1-4.

Under this name, Herbst has inauspiciously united the *Pap. Thalia*, of Hübner, and that of Esper, which represent similar accidental varieties of *Argynnis Euphrosyne* and *A. Selene* respectively.

57. Pap. Trivia, p. 173, t. 276, f. 1-4.

The figures represent *Melitæa Cynthia*, W. V.

62. Pap. Antigonus, p. 212, t. 278, f. 5-8.

This is the true *M. Trivia*, W. V.

67. Pap. Parthenii, p. 238, t. 283, f. 1-4.

As Borkhausen (I. p. 53) expressly refers to Esper's *Athalia minor*, copied by Herbst, as his *Parthenie*, it appears to me doubtful whether we ought not to consider these the typical figures, instead of quoting Borkhausen's 2nd vol., p. 194, against the first (as Staudinger has done in his recent catalogue), unless the description is very clear; and I believe it has often been disputed.

7. Pap. Esra, p. 260, t. 285, f. 4-6.

Amblypodia Helius, Cr. (201 F, G). Cramer figures a totally distinct species, also as *Helius*, a few plates before; and hence Herbst has justly changed the name.

12. Pap. Hylassus, p. 266, t. 286, f. 7-8.

This name will take precedence of *Euchylas*, Hübn., for *Plebeius Hylas*, St., *nec* W. V.

15. Pap. Pelopus, p. 270, t. 287, f. 5, 6.

As *Pap. Pelops*, St., is considered = his *Thecla Caranus*, the name *Pelopus* is superfluous, although two other butterflies bore the name *Pelops* before this.

32. Pap. Cyllarissus, p. 297, t. 291, f. 3, 4.

Thecla Cyllarus, Cr., *nec Plebeius Cyllarus*, Rott.

39. Pap. Silenissa, p. 306, t. 292, f. 7.

Pap. Silenus, St., = *Thecla Phaleros*, L.; and therefore did not require a new name.

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48. *Pap. Eryssus*, p. 316, t. 294, f. 3.

If it be thought necessary to change the name of *Thecla Erix*, Cr. (*nec Deudorix Eryx*, L.), Herbst's name has priority over *Tyrrhenus*, Hübn.

Vol. 11. By Herbst, 1804.

78. Pap. Amelia, p. 26, t. 300, f. 3, 4.
Thecla Ætolus, Sulz.

79. Pap. Amyntor, p. 27, t. 300, f. 5, 6.
Deudorix Eryx, L.

88. Pap. Hesiodus, F., p. 41, t. 302, f. 5-8.
Hypolycæna Faunus, Dr.

89. Pap. Amor, F., p. 43, t. 302, f. 9, 10.

Herbst has rightly figured *Pap. Triopas*, St., under this name.

95. Pap. Lincus, F., p. 56, t. 304, f. 7, 8.
Another figure of *Thecla Ætolus*, Sulz.

96. Pap. Plato, F., p. 58, t. 304, f. 9, 10.

Herbst has figured *Plebeius Celeno*, Cr., as this species; but Donovan and Butler figure a very different insect as *Plato*, F.

99. Pap. Telicanus, Lang, p. 65, t. 305, f. 6-9.

Herbst was the first author to figure both sexes of this species.

106. Pap. Cerasi, F., p. 97, t. 307, f. 8, 9.
Herbst figures *Thecla Ilicis*, ♀, Esp., under this name.

4. Pap. Cyllarus, Rott., p. 172, t. 309, f. 7-9.

5. Pap. Dymus, p. 175, t. 309, f. 10, 11.

Herbst has figured the sexes of *Plebeius Cyllarus* as distinct; the insect figured as *Cyllarus*, ♂, is apparently *Plebeius Iolas*, O.

6. Pap. Semiargus, p. 177; *Pap. Acis*, t. 310, f. 1-3.

12. Pap. Zachæus, p. 195, t. 311, f. 9, 10.
Probably *Plebeius Otis*, F.

13. Pap. Nanus, p. 197, t. 312, f. 1, 2.
Resembles *Plebeius Ceraunus*, ♀, F.

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40. Pap. Tespis, p. 270, t. 317, f. 7, 8.

Herbst figures *Plebeius Palemon*, St., in Cr., which is not the true *P. Tespis*, L.

70. Pap. Arites, p. 307, t. 322, f. 4.

Plebeius (?) *Arius*, Cr.

Herbst divides the Diurnal Lepidoptera into Equites Troes and Achivi; Heliconii; Parnassii; Danai Candidi; Consules (*Euplœa*, &c.); Nobiles (*Kallima*, *Siderone*, &c.); Præfecti (*Vanessa*, &c.), Prætores (*Satyrinæ*); Vestales (*Mesosemia*); Archontes (*Limenitis*, *Hypolimnas*, &c.); Dictatores (*Cœrous*, *Lethe*); Milites (*Argynnis* and allies); Ephori (tailed *Lycœnidæ*); Cives (tailless ditto); Rustici (*Hesperidæ*).

I am much indebted to Messrs. Butler and Hewitson for information respecting several species mentioned above; and to the former for his having called my attention to the book as imperfectly quoted by authors.

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VII. *On the genus* Acentropus. By J. W. Dunning, M.A., F.L.S., &c.

[Read 4th March, 1872.]

I have to announce the capture of *Acentropus* almost in the heart of London, about a furlong from the Regent's Park canal. Between nine and ten o'clock one evening, in the latter half of July, 1871, an insect attracted my attention, chiefly by the peculiarity of its flight round the lamp near which I was sitting; in colour and general appearance it was insignificant enough, and might have been a small *Crambus;* but it had not the weak and vacillating motion of a *Crambus,* for it flew with decision and in circles, or rather semi-circles, alighting constantly on the table for a moment, then flitting off to perform another round. When it sat for an instant, the horizontal and deltoid pose of the wings, and an indescribable sprawl of the legs, reminded me of *Hydrocampa.* I had not recognized the insect as *Acentropus,* and it was only on the following morning, when I had killed the specimen, that I found out what it really was. But the living insect was certainly to my eye a moth, and it produced upon my mind the impression of a Cramboid *Hydrocampa.*

In 1791, Olivier gave a short description of what is supposed to be our insect; he placed it in his third section of the Order Neuroptera, and called it *Phryganea nivea;* at the same time he remarked, that the *Phryganeæ* form a link between the *Phalænæ* and other four-winged insects. Latreille followed Olivier, and apparently was acquainted with *P. nivea* only from Olivier's description.

In 1829, Stephens introduced into his 'Systematic Catalogue of British Insects,' the name "*Acentria nivosa* (*Ph. nivea,* Oliv. ?)" and placed it in the Neuroptera, amongst the *Perlidæ.* In the same year, Curtis in his 'Guide to the Arrangement of British Insects,' introduced the name *Acentropus Garnonsii,* as distinct from *Acentria.* And in 1833, Stephens, in the second edition of his 'Nomenclature,' gave *Zancle Hansoni* as distinct from *Acentria nivosa.* But there was no description of any of these.

In 1834, in vol. xi. of 'British Entomology,' Curtis characterized the genus *Acentropus,* and on pl. 497 he

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figured the male *A. Garnonsii*. He placed the genus in the Order Trichoptera, fam. *Phryganeidæ*; but he remarked that, "so near an approach does *Acentropus* make to the Lepidoptera, that if the palpi were broken off, it would not be easy to decide to which Order it belonged, whether to the Trichoptera or Lepidoptera. The mealy texture of the insect might induce an opinion that it was Trichopterous, whilst the contour and neuration of the wings would be in favour of its relation to the Lepidoptera. The absence of a proboscis proves nothing, since it is sometimes wanting in the *Bombycidæ* and other groups. I do not, however, remember any instance amongst the Lepidoptera in which the maxillary palpi are strongly developed, and the labial absent; yet such appears to be the case in *Acentropus*."

In 1835, in the first volume of our 'Transactions,' Westwood, after examining the original specimens, identified *Acentria nivosa* with *Acentropus Garnonsii*, and mated them with *Zancle Hansoni* as the female. And in the same paper he pronounced the insect to belong to the Lepidoptera, relying not only on the scales of the wings, but particularly on the presence of the thoracic tippets, and the bristle at the base of the hind-wing.

In 1836, Stephens, in his 'Illustrations,' adopted Westwood's conclusion as to the identity of *Acentria*, *Acentropus*, and *Zancle*, and united the three under the name *Acentropus niveus*. It is manifest also that he thought the genus belonged to the Lepidoptera, but "having completed the Lepidoptera," he "temporarily" placed the "*Acentropidæ*" at the beginning of the Trichoptera, "rather than omit all notice of this singular family."

In 1840, Westwood, in his 'Introduction,' returned to the subject, and unhesitatingly placed *Acentropus* in the Order Lepidoptera.

In 1843, Boitard mentioned *Phryganea nivea*, but he simply reproduced (with a verbal alteration) the brief description given by Latreille, and does not appear to have known anything about the insect itself. In 1848, Kolenati, and in 1852, Walker, rejected *Acentropus* from Trichoptera, and referred it to the Lepidoptera.

In 1856, Brown again called attention to the Order to which this genus belongs; and afterwards, in a paper read before the Northern Entomological Society, having

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discovered the earlier stages, he said the pupa and pupa-case were those of a moth. In 1857, Hagen pronounced the insect to be truly Lepidopterous; and Newman arrived at the same conclusion (Zool. p. 5629). In the 'Entomologist's Annual' for 1858, Stainton figured *Acentropus niveus*, as "having been finally handed over by the Neuropterists to the Lepidopterists." In the same year Kolenati again considered the question, and treated the insect as an indubitable Lepidopteron. In 1859, the genus was inserted in Stainton's 'Manual of British Moths,' but was omitted from Doubleday's 'List of British Lepidoptera.' In 1860, Möschler described an *Acentropus latipennis*, and sent it to Herrich-Schäffer to be figured with other new Micro-Lepidoptera; in the following year Herrich-Schäffer figured it as such, and Staudinger and Wocke included the genus in their Catalogue of European Lepidoptera.

In 1861, Scott renewed the enquiry "Is *Acentropus niveus* a moth? or does it belong to the *Phryganidæ*—genus *Chimarra?*" M'Lachlan denied that it was a *Chimarra*, but seemed at that time undecided whether it was Lepidopterous or Trichopterous, perhaps near *Sericostoma*. Newman again expressed doubt, and demanded further investigation. In 1862, Cooke again enquired, "Does it belong to the Lepidoptera or the Phryganeina?" inclining to the former view; the effect, however, of his discussion, was to make Newman retract his "rash guess"* that the insect was Lepidopterous, and "to leave the question as far off a solution as ever."

In 1863, Brown devoted a chapter in 'The Natural History of Tutbury' to the genus *Acentropus;* as already mentioned, he had discovered the larva and pupa, and founding his conclusion mainly on the primary stages, he considered it as no longer admitting of doubt that the genus belongs to the Lepidoptera. Haliday also (according to Brown) regarded the pupa and pupa-case

* One would suppose, from this expression, that Newman had himself been the originator of the idea that *Acentropus* was Lepidopterous. In truth, however, his "rash guess" was arrived at from an examination of specimens transmitted by Brown (see Zool. 1857, p. 5629), whilst, for more than twenty years previously, the Lepidopterous view had (as we have seen) been advocated by Westwood, Kolenati, Walker, Brown, and Hagen successively.

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as conclusive. In 1865, Heinemann included the genus in his 'Klein-Schmetterlinge;' in the same year, M'Lachlan, having got the better of his former doubt, spoke of *A. niveus* as one of "two species of Lepidoptera erroneously described as Trichoptera;" and in 1868, Brauer did not include *Acentropus* in his 'Verzeichniss der bis jetzt bekannten Neuropteren im Sinne Linné's" (Verh. z.-b. Gesell. Wien. xviii. 359).

In 1867, Zeller, and in 1869, Nolcken, Speyer, de Graaf, Snellen, and Tengström, all agreed in referring *Acentropus* to the Lepidoptera, and Speyer went elaborately into the question (Stett. Ent. Zeit. 1869, p. 400). He examined the mouth most carefully, and confirmed Westwood's view, that the large 3-jointed palpi are the labial and not the maxillary palpi (thereby removing the main ground upon which Curtis rested); a pair of one-jointed maxillary palpi are present, but very small,* attached at the upper side of the base of the large palpi, and they are mentioned by Kolenati as "a brown tuft on the outside at the base of each palpus," and by Westwood as "a pair of small lateral appendages of the palpi;" and a pair of minute thread-like maxillæ may also be detected. The difficulty of a correct determination of the parts of the mouth, in addition to the smallness and imperfect development of the maxillæ and maxillary palpi, depends really upon the circumstance that they are placed unusually close to one another, and take their rise almost at the same spot; it required careful examination to make certain that, in fact, the base of the large palpi occupied the nethermost place. Speyer also detected a peculiar appendage to the fore-tibiæ, which is found in many Rhopalocera and most Heterocera, but so far as is known, does not occur in any Trichoptera; he observes that the tegulæ or scapulæ are large, and of the typical Lepidopterous form; he notes likewise the fixing apparatus of the wings, the strong simple bristle of the hind-wings, the erect hair-scales at the base of the fore-wings on the underside, and the formation of the hinder parts of the abdomen, which is quite similar to that of many Lepidoptera, *e. g. Sphingidæ*. He concludes,

* M'Lachlan states (Intell. ix. 132) that in the female all the palpi are rudimentary. This is scarcely correct; the labial palpi, though smaller than in the male, are large in comparison with the maxillary, and are accurately figured by Brown.

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"*Acentropus* is, then, a genuine Lepidopteron, with some peculiarities no doubt, but having nothing contrary to the character of the Order, and capable, without offence, of being included in it, and only in the Lepidopterous type. A rudimentary sucker, or even the entire absence of a sucker, is not uncommon in moths, and the maxillary threadlets of *Acentropus* have, in fact, a resemblance to the aborted sucker of many other moths. Considerable development of the always 3-jointed labial palpi, in contradistinction to the smallness of the maxillary palpi, is the rule in Lepidoptera, and little or nothing can be detected, in many moths, of the mandibles and the other feeding apparatus. The only thing which, to my knowledge, occurs in the same fashion in no other part of the Order, is the close approximation of the two pairs of palpi to one another, the removal of the labial palpi up to the base of the maxillæ and maxillary palpi. In all other Lepidoptera which I have examined, the two pairs of palpi are separated by a considerable interval, while the labial palpi are placed much further back, on the under-surface of the head. But this is the only important thing which is peculiar to *Acentropus*, whilst the rest of its organization collectively shows the Lepidopterous type, and in some of its characteristic parts in a very pronounced form. Thus, the fastening of the wings, and the tegulæ, which occur in such perfection neither in the Phryganeina nor in any other Order of insects. Then the wing-veins, with their simple discoidal cell, the complete covering of scales, and the appendages of the fore-tibiæ. Moreover, the habit of the imago has nothing Phryganeous about it, and it is, in fact, scarcely conceivable, how people can have mistaken the Lepidopterous nature of the creature. It cannot even be considered as an approach of the Lepidopterous type to that of the Phryganeina, as in the interest of Darwinianism I had hoped, since it has with the latter group nothing in common but the mode of life and the gill-bearing larva, which is found in so typical a Lepidopteron as *Paraponyx stratiotata*. Other families of moths, as the *Psychidæ*, and especially the *Tineina* with long maxillary palpi, above all, the *Micropterygidæ*, have much more essential characters in common with the Phryganeina than *Acentropus* has. The characteristic difference between Lepidoptera and Phryganeina lies in the totally different form of the parts of the mouth, and these organs in *Acentropus* in no way approach the type of the Phryganeina."

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In a subsequent paper, 'Zur Genealogie der Schmetterlinge" (Stett. Ent. Zeit. 1870, p. 202) Speyer makes a detailed comparison of the structure and development of the Lepidoptera and Trichoptera, and again concludes that *Acentropus* is a true moth, which recalls the Phryganeina only by its aquatic and branchiiferous larva, whilst the imago has at most but a superficial resemblance to them, but has the typical character, both of wing and body, of a moth, and even in that which distinguishes it from other Lepidoptera, it does not approach the Phryganeina, nor in that particular which is most conclusive, the formation of the parts of the mouth.

After these quotations from Speyer, it seems almost surplusage to add, that in 1870, Millière figured *Acentropus* in his 'Iconographie de Lepidoptères,' and Knaggs included it in his List of Lepidoptera; and that in 1871, Ritsema, in his historical retrospect of the genus, published in the 'Tijdschrift voor Entomologie,' unhesitatingly considered the insect to be a moth.

But in 1872, Newman returns to the subject, and after informing us that 'it is nothing more than a conventional idea, or sometimes a convenient assumption," that wing-scales are confined to Lepidoptera, he adds, that "the assumption is utilized now and then to set up some hobby, such for instance as the Lepidopterous nature of *Acentria*, which assumption remains standing only until some one of more extended or more careful powers of observation, or more skilled in logical deductions, knocks it down again" (Entom. vi. 10).

We all know, that every periodical has a "some one" who is necessarily, and *ex officio*, of more extended and more careful powers of observation, and more skilled in logical deductions, than any other one who presumes to differ from him. But making due allowance for the "conventional idea" of the omniscience, and the "convenient assumption" of the infallibility of editors in general, (and speaking in all good-humour, and with every respect for my friend) I cannot characterize this sentence otherwise than as editorial "bounce." It was no part of my plan to have given the preceding sketch, but I have been led to do so by reading the remarks of the editor of 'The Entomologist,' which I have just quoted. Of course, Newman may be right, and all the world wrong; and equally of course, if Newman is wrong, he is entitled to retain his own opinion; but at the risk of repeating a

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thrice-told tale, I have thought it worth while to show that, so far as published authority goes, there is an overwhelming preponderance of opinion against him, and that those who are against him have given very good reasons for their opinions. We are not told by whom the "convenient assumption" has been made; and though doubtless the presence of the wing-scales has been alleged as one ground, and an important one, for regarding *Acentropus* as a moth, yet it is but one circumstance among many, and it seems to me inaccurate to say, that any one has "utilized the assumption to *set up* the hobby" in question, for no author has relied exclusively or even mainly on the presence of wing-scales, but everyone has placed far greater dependence on other (less popular and more technical) characters. The tippets and wing-bristle originally set up the hobby. The passage about extended and careful observation and skill in logical deduction, leads one to enquire, Can Newman, when he penned it, have read the papers of Speyer?

Let me ask, what is to happen when the "standing assumption" is "knocked down again?" The assumption is, that wing-scales are confined to Lepidoptera. Let us get rid of that assumption (if anybody has made it), and let us assume the contrary, that wing-scales are not confined to Lepidoptera. From the premises, (1), *Acentropus* has wing-scales, and (2), wing-scales are not confined to Lepidoptera, are we expected to draw the conclusion that *Acentropus* is not Lepidopterous? I am not "skilled in logical deductions," but it seems to me, that when the assumed assumption has been knocked down again, the argument in favour of the Lepidopterous conclusion remains untouched.

But probably it is not the "assumption," but the "hobby" which is intended to be pugilistically dealt with. Let us, then, look for a moment at the arguments by which the "hobby" has been hitherto "knocked down." Newman's reasons are given at p. 8216 of 'The Zoologist,' and appear to be four in number:—(1), "scales far more like those of Lepidoptera occur on the elytra of a thousand beetles;" (2), the thoracic tippets do not "obtain throughout" the Lepidoptera; (3), the wing-bristle "tends as much to unite *Acentropus* with the Hymenoptera as with the Lepidoptera;" and (4), the characters in which the pupa of a moth differs from that

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of a *Phryganea* require to be more distinctly pointed out. Westwood has dealt with these grounds *seriatim* (Proc. Ent. Soc. 1862, p. 101); and, so far as I can discover, these are the only reasons which Newman has published for doubting that *Acentropus* is a moth. As suggesting points for further examination and explanation, the four propositions are harmless enough; but to suppose that the enunciation of them has "knocked down the hobby," or that by the repetition of them, the hobby will be "knocked down again," is surely a miscalculation of the strength of the arguments. I understand the question to be "Is *Acentropus* lepidopterous, or is it trichopterous?" By the first proposition, the presence of wing-scales is admitted; it can scarcely be contended that their presence is an argument *against* the insect being lepidopterous, and it can hardly be intended to suggest that *Acentropus* is coleopterous; but unless such a suggestion is intended, the proposition is wide of the mark: there is no question about beetles, and to answer the inquiry "Lepidoptera or Trichoptera?" by saying "It is like Coleoptera" is no answer at all. Again, it can hardly be intended to suggest that *Acentropus* is hymenopterous; but unless such a suggestion is intended, the third proposition is only throwing dust in the eyes, and diverting attention from the real question, "moth or caddis-fly?" But the second proposition is, perhaps, the most curious of all: from the premises, (1), *Acentropus* has tippets, and (2), some Lepidoptera have not tippets, it can scarcely be argued, much less "logically deduced," that *Acentropus* is not lepidopterous.

Newman concludes (Zool. p. 8217) by indicating "the proper mode of proceeding in such a case as this," and finally asks for a "verdict solely on the evidence." I have only had an opportunity of examining the imago; but, bearing in mind, that "its mouth, wing-rays, thorax and legs should have especial care bestowed on them," the result of my own examination has been to satisfy me that it is a moth. The earlier stages confirm this view; the eggs are not enclosed in a jelly-like substance, as is usual with Trichoptera; and the larva and pupa have nothing of the trichopterous type about them. The mouth and head of the larva of *Acentropus* are unlike any known caddis-worm; whilst the mummy-like pupa is totally different from the pupæ of Trichoptera, with their free legs and antennæ, and their strong mandibles, with which

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they gnaw their way out of their case. And though it is quite true that further details are required to give a complete "life-history of *Acentropus*," I have no hesitation in saying that, deciding on the evidence now forthcoming, the insect is a moth.

There is one point to which I may here allude—the presence or absence of ocelli in *Acentropus*. Curtis says "ocelli two, placed behind the antennæ," and his fig. P. shows the ocellus plainly enough. "Ocelli two," re-echoes Stephens.* In Westwood's figure of the head (Introd. ii. fig. 113, No. 12) there is an indication of what I take to be an ocellus. And Kolenati says, "two ocelli behind and between the insertion of the antennæ on the top of the head," and his fig. 4 shows them distinctly (Wien. Ent. Mon. 1858, pl. vii.).

On the other hand, Brown found no ocelli; Heinemann gives "ohne Ocellen" as one of the characters of the genus; and Nolcken and Speyer searched for them in vain.

I was unable to detect any ocelli in my own specimen. But in the autumn of last year, M'Lachlan, for my satisfaction, subjected several specimens to microscopic examination; after denuding the head of its scaly clothing, the result was that, on one specimen, he, Douglas, and I saw something—a kind of metallic disc, to all appearance—which may have been an ocellus. But it was not behind the antennæ, or between the antennæ; it was on the outside of the antenna, in a depression or excavation of the basal joint. I believe Douglas and M'Lachlan were satisfied that it was an ocellus: for myself, I doubt.

In the Lepidoptera, there are either two ocelli or none; in the Trichoptera, three or none. If, then, the positive evidence in favour of the existence of two ocelli be accepted, we have another reason for referring *Acentropus* to the Lepidoptera, and not to the Trichoptera. On the other hand, if the weight of evidence be held to disprove the existence of any ocelli, their absence affords no argument either way.

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* But there is strong intrinsic evidence that Stephens' description was not drawn up from personal examination, but was copied from Curtis's. A word is varied here and there, just sufficient to escape being a mere transcript; but the phraseology produces (in my mind, at least) conviction, that one description was taken from the other.

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Of course, the generic name *Acentropus* was given to the insect in allusion to the supposed absence of tibial spurs. But according to Nolcken, *Acentropus* is a misnomer, the legs possessing spines, which render the name inapplicable. Under the microscope, he found at the end of the mid-tibia one, and on the hind-tibia, not far from the middle, one, and at the end another, small spine. All previous authors had agreed in describing the tibiæ as without spurs or spines, and Speyer (whose specimens were sent to him by Nolcken) in his first paper (Stett. Zeit. xxx. 405) spoke of the spur-less legs; but subsequently (xxxi. 222, n.) he says that he has confirmed Nolcken's statement, but the spurs are minute and fragile. For myself, I see, but only on one or two specimens, very small and very short spurs.* But as between Lepidoptera and Trichoptera, how stands the argument, so far as the armature of the tibiæ is concerned? If the middle and hind-tibiæ are spurred (as must now be admitted to be the fact), this is the rule in one Order as much as in the other; but if they were not spurred, this would be as much at variance with the rule in one Order as in the other. And either the presence or the absence of spurs leaves the question unanswered.

A few words next as to the various positions in the Order Lepidoptera which have been assigned to *Acentropus*.

Stephens spoke of the *Tineidæ* as "the only family to which it can be allied;" and in 1840, Westwood placed it provisionally in that family, between the genera *Euspilopteryx* and *Gracilaria*. Five years later, in his 'British Moths,' we find the genus at the very end of the *Tineidæ*, following the Trichopteroid genus *Eriocephala* (*Micropteryx*), *Euspilopteryx* and *Gracilaria*, and coming immediately before the *Pterophoridæ*; but it is noted, at the same time, that it is "probably nearer to some of the *Hyponomeutidæ*." In 1848, Kolenati expressed an opinion that *Acentropus* belonged to the *Pyralidina*, and the pupa and habit of the larva at first led Brown also to consider it allied to *Hydrocampa*, an opinion which he subsequently changed. In 1859, Stainton placed it in the family *Hy-*

* When this paper was read, Westwood exhibited drawings of *Acentropus*, made in 1860, from specimens given him by Brown; and these drawings fully confirm Nolcken and Speyer as to the presence of the minute spines on the mid- and hind-tibiæ.

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*drocampidæ;** and Hagen and Zeller appear to have regarded it as belonging to the *Crambina*. In 1861, Staudinger and Wocke adopted the "china-mark" theory, and catalogued the genus between *Cataclysta* and *Nymphula;* and Westwood thought it "most nearly allied to the family *Crambidæ*." In 1862, Cooke reverted to the Tineine hypothesis, and suggested its affinity to *Chimabacche, Epigraphia,* and *Exapate.*† In 1863, Brown arrived at the conclusion that its true place is amongst the *Bombycina,* but that for an insect altogether so anomalous, a special family must be constituted. In 1865, Heinemann included the genus in the *Botidæ,* placing it at the end of the family, immediately after *Hydrocampa, Paraponyx,* and *Cataclysta*; and Zeller, in reviewing Heinemann, agreed that its proper position is between these aquatic moths and the *Chilonidæ*. In 1869, Tengström catalogued the genus between *Cataclysta* and *Nymphula;* de Graaf and Snellen placed it in *Pyralidina;* and Speyer, recognizing the fact that the insect stands heterogeneously in the *Botidæ,* as indeed everywhere, proposed that it should rank as a separate family between the *Botidæ* and *Chilonidæ*. In 1870, Knaggs catalogued the "*Acentropidæ*" between the *Hydrocampidæ* and *Botydæ;* and Millière figured *Acentropus* as belonging to the *Crambina*. Finally, Staudinger and Wocke, in 1871 (merging the *Crambina* in the *Pyralidina*), placed the family *Acentropodidæ* between the *Pyralididæ* (of which the last genera are *Hydrocampa, Paraponyx,* and *Cataclysta*) on the one hand, and the *Chilonidæ* and *Crambidæ* on the other hand.

Thus, we have a Tineine, a Pyralidine or Crambine, and a Bombycine view; and, of course, there is something to be said in favour of each. I believe it is not doubted that *Micropteryx* belongs to the *Tineina,* and, perhaps, of all moths, that genus is the most like the Trichoptera; it seems natural, therefore, that *Acentropus* and *Micropteryx* should not be placed far apart, though, in fact, their technical characters are considerably different. Whether Westwood considered *Acentropus* to

* In 1858, the present writer, in a letter to Stainton, enquired whether *Acentropus* should not come near *Hydrocampa*. On the 13th of March, 1858, Stainton replied, "*Acentropus* will probably be placed near *Hydrocampa*, but I have not yet definitively settled its position."

† Heinemann transfers *Exapate* from the *Tineina* to the *Tortricina*.

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connect the *Tineina* and *Pterophorina*, I do not know; it may be fancy on my part, but I do fancy I detect an affinity between *Acentropus* and *Agdistis*. The approximation to the *Hyponomeutidæ* does not appear to me so manifest; I suppose the recurved or drooping palpi are the principal thing relied on; but in Knagg's 'Cabinet List' the *Hyponomeutidæ* are the next family to the *Micropterygidæ*. Again, there is plausibility in the suggestion of relationship between the phryganoid *Acentropus* and *Chimabacche phryganella*; next to the *Epigraphiidæ* or *Chimabacchidæ*, the *Psychidæ* are also placed by those who regard that family as *Tineina*, and it scarcely needs to be added that the *Psychidæ* are very like *Phryganeina* in some respects, and have, indeed, been classified with Neuroptera; moreover, the existence of wingless or but partially-winged females in *Acentropus*, is a feature which that genus possesses in common both with *Chimabacche* and *Psyche*. So far as I am aware, Brown is the only author who has referred the genus to the *Bombycina*; it is to this group that the *Psychidæ* are relegated by those who expel them from the *Tineina*, and Brown would place them in the same section of the *Bombycina*; but the families with which he suggests that *Acentropus* has the nearest affinity are the *Hepialidæ* and *Zenzeridæ*, agreeing with the former "in the general shape of its larvæ, in the absence of spines on the legs of the imago [see, however, p. 130], and in the substitution for them of hair, in the want of a labrum, and in the almost total absence of maxillæ;" and with the *Zenzeridæ* "in the shape of larva, small development of maxillæ, and general form of the palpi." On the other hand, the general appearance of the imago is strongly suggestive of a *Crambus*, but the retrorse palpi and the neuration of the wings do not agree with those of the *Crambidæ*; whilst the aquatic habit of the insect, the mode of life, and the metamorphoses, are so plainly indicative of affinity to *Hydrocampa*, that I willingly go with the current of recent opinion, and recognize the true place of the *Acentropodidæ* to be where Staudinger and Wocke have placed them, that is to say, in the *Pyralidina*, leading up to the *Chilonidæ* and *Crambidæ*.*

* Knaggs suggests that the *Pterophorina* should follow next after the *Pyralidina* (Cab. List Lepid. p. 11). If this be so, it brings *Agdistis* into close proximity with *Acentropus*.

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Let us now bring together, as a connected narrative, the scattered observations on the habits of *Acentropus*.

Olivier and Latreille say nothing about its mode of life, but from its having been described as a *Phryganea*, we may infer that it was found in the neighbourhood of water. "Found on willows," near a canal, was Stephens' account; "in an osier bed," was Brown's first report. Kolenati, however, in 1846, discovered that the imago affected certain species of *Potamogeton*, and suspected that the pond-weeds were the food-plant of the larva; informed by Haliday of Kolenati's observations, Brown, who in 1855 and 1856 captured the moth flying over the river Trent, was enabled to find pupæ in 1857, and in the following year to obtain both larvæ and pupæ.

Previously to this, Curtis and Dale had found, at Glanville's Wootton, what they supposed to be the eggs of *Acentropus;* they were exhibited at the Meeting of this Society on the 4th of September, 1854, and are described in the 'Proceedings' as "a large mass of white and very elongated eggs." The oviposition was not actually seen, but the eggs were found at a spot where *Acentropus* abounded, and near a female specimen which was captured, and exhibited at the same meeting; and there cannot, I think, be any reasonable doubt that they were really the eggs of *Acentropus*. I suppose these eggs have gone to the Antipodes with the rest of Curtis's collection; but Hagen saw them, and has described them as "a number of white roundish eggs, lain thickly together on a *Potamogeton* leaf." There is, however, a discrepancy between the two accounts as to the shape of the eggs. In 1861, Knaggs had some eggs laid on his setting boards, by specimens captured at Hampstead; he described them as having "a most striking resemblance to those of *Paraponyx stratiotalis*." Herrich-Schäffer, in the same year, figured the female specimen on which Möschler based the species *A. latipennis*, and he depicts her with a string of eggs at her tail; M'Lachlan has shown me one of his Hampstead examples with a similar string, and Knaggs has a continental *A. latipennis* with eggs attached. In these cases, the colour of the egg is dirty-white, or yellowish; and the shape is "roundish," rather than "very elongate."

The larva is of a light green colour, and like those of *Hydrocampa*, *Paraponyx*, and *Cataclysta*, it lives on

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aquatic plants below the surface; it has gills, and lives freely in the water. It has been figured by Brown. It appears to feed exclusively on the pond-weeds, but has been found on several species; thus Kolenati (who, however, was acquainted with the imago only) mentions *Potamogeton heterophyllus* and *perfoliatus;* Brown and Heinemann mention *P. pectinatus* and *perfoliatus;* Ritsema mentions *P. crispus;* and Millière mentions *P. pectinatus* and *lucens*. When fully fed, in June or July, the larvæ may be found "in silken cocoons, which are strengthened by small pieces of the leaves incorporated longitudinally in the fabric, and which are placed in the submerged axils" of the thread-like leaves of the *Potamogeton*. Brown found only fully-fed larvæ, but Ritsema and Reutti found them in various stages of growth.

The pupæ are described by Brown as "of the masked character, and the external case enables one to see clearly which will produce males and which females;" both the male and female pupæ are figured by him, and exhibit three remarkably prominent spiracles on each side. To acquire the pupæ, Knaggs recommends dragging the stream or pond with a water-net, where *Potamogeton* grows, examining it on the shore for the small silken cocoons.

The imago appears in June, July, and August; though not continuously for the whole period. During the three months mentioned, the insect may be found in all its four stages of egg, larva, pupa, and imago; and it would seem that about ten months of the year (including the winter months, as with *Hydrocampa* and *Paraponyx*) are passed in the larval state, and about one month in the pupa.

The male imago is much more common, or more commonly observed, than the female; occasionally it is found in swarms. Kolenati captured forty-two specimens in the Neva, all males; Nolcken went to the same locality, and took something like 150, again all males. Zeller had it in numbers from Pomerania, but only of the male sex. Hagen had seen it in numbers, but could not remember a single female taken in Prussia. Dale, in the last letter I had from him (within three months of his death, when the veteran entomologist was over eighty), wrote "the males were in great abundance, the females very rare." Brown, in a recent letter, writes "I have seen, I should almost say, hundreds of males on the wing at a time. Ritsema took fifty specimens near Haarlem, all males.

Unless disturbed, they are inactive by day, but fly briskly in the evening over the surface of water. Kole-

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nati found them sitting sluggishly on the *Potamogeton*, close to the water, the majority on the flowers and young seeds; when active, they ran on the surface of the water. According to Dale, "they flew nearly on the surface of the water, sporting about in various directions." Brown found them quietly sitting on leaves, or other objects which protruded from the stream, whilst others flew slowly, or, as he elsewhere expressed it, were "skipping along over the surface" of the Trent. Reutti's observation is, that the male flies always close to and on the water, by day only involuntarily, but by night briskly. M'Lachlan records that between eight and nine, p.m., in June, "they began flying rather rapidly over the surface of the water, and close to it, occasionally coming on to the wet mud." Knaggs mentions that "it skims along the surface of the water," but although the usual habit is to fly close to the water, he has "occasionally seen it mount perpendicularly into the air, rising higher and higher, until lost to sight." M'Lachlan tells me that he too saw the male thus mount into the air, but only when caught by a current of wind, so that it was an involuntary act. Boyd tells me that he observed the females to fly, as a rule, at a greater height above the water than the males. Nolcken found them, either sitting drowsily on floating pieces of *Potamogeton* or other objects, often two or three so close together that at first he thought they were *in coitu*, or fluttering about in small circles close to the surface, then raising themselves a few inches above it, but descending again immediately, so that their feet were almost always touching the water. Barrett "found some faggots sunk with stones in one corner of a pond, leaving some of the twigs above water; and on the underside of these twigs *niveus* swarmed, sometimes clustered four or six in a bunch; they were very sluggish, and, if knocked off a twig, only buzzed along the surface of the water till they found another." Ritsema describes them as sitting by day on the stems of plants close to the water, and when disturbed, coming quickly to rest again, but in the evening, flying nimbly in large circles over the surface, touching the water itself, and settling but rarely. Corbin describes the flight as most peculiar, "as it never seems to leave the surface of the water, but swiftly flutters its tiny wings, and in the dusk of the evening looks almost as if it was swimming about here and there; . . . . but in the day-time it will be found

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settled on the underside of leaves, &c., close to the water's edge." I have already mentioned that it was the circular flight of the insect (a male) round a lamp and over the surface of a table, which first attracted my attention to the specimen which gave rise to this paper; de Graaf captured two males which were similarly attracted to a lamp and performed their antics on a tablecloth; and Stainton, some years ago, took a female specimen at Lewisham which flew to a gaslight fixed outside his house. Brown, Dale, and Barrett all mention to have seen many dead specimens floating on the pond-weed, or on the surface of the water; and during the daytime, Knaggs and M'Lachlan found that the living specimens might readily be fished out from off the *Potamogeton*, by means of a shallow net with a long handle.

The form originally named *Zancle Hansoni* by Stephens has been already mentioned as the female; this form has fully developed wings, and it was not until 1854 that the existence of an apterous form of the female of *Acentropus*, or one with only rudimentary wings, was established. Simultaneously with the above-mentioned discovery of the eggs, Curtis and Dale found this second form of female; and the event is somewhat meagrely reported in our 'Proceedings' as follows: "Mr. Curtis exhibited specimens of *Acentropus Garnonsii* from Glanville's Wootton, including the apterous female,"—as if the apterous female, instead of being a novelty, was a familiar creature. The Dorsetshire females (as I was informed by Dale) were not absolutely apterous, but had rudiments of wings. In 1858, Brown found at Burton-on-Trent a pupa from which an apterous female emerged; the Burton females (as figured by Brown) were absolutely apterous, without a vestige of wing. In 1860, Möschler* described *A. latipennis* from a female example from Southern Russia, which was amply winged; and his description mainly consists of a comparison with another winged insect which he supposed to be the female of *A. niveus*.† In

* Brown (Nat. Hist. Tutbury, p. 401) erroneously attributes the description of *A. latipennis* to Kolenati.

† Upon this Brown remarks, that "it is manifest the insect he describes as *A. niveus* is of the male sex; the comparative characters are, therefore, useless." In other words, Möschler's comparison only shows the distinction between the sexes. I do not quite see, however, why the insect with which the ♀ *latipennis* is compared, may not have been a winged female of the *Zancle* form.

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1865, Heinemann described the female of the *Acentropus* from the Bodensee (Lake of Constance) as having very short pointed rudiments of wings. And in 1871, Ritsema bred from a pupa found near Haarlem a female with rudimentary wings.

In 1859, Hagen remarked, "it is a matter of interest that it appears to have two forms of female, one with short, the other with long upper-wings; of both forms, Stainton's and Stephens' collections contained specimens." I suppose the "form with short wings," refers to the specimens with rudimentary wings, captured by Curtis and Dale at Glanville's Wootton: for so far as I can gather, the Dorsetshire specimens are the only known British specimens that have rudimentary wings, and Brown's Burton specimens are the only known specimens that are absolutely apterous. The female specimens in Stainton's collection are all fully winged, and as Stephens died in 1852, before the apterous form was discovered, I fancy that Hagen, writing from memory, must have erroneously attributed to Stainton's and Stephens' collections what he actually saw in Curtis's. Stephens' collection is now incorporated with the general collection of British insects in the British Museum, and *Acentropus* has been transferred from Neuroptera to Lepidoptera; that collection contains four females of *Acentropus*, but all are fully-winged.* In addition to the British Museum and Stainton's collections, I have been permitted to examine those of Bond, Boyd, Knaggs, M'Lachlan, Stevens and Wormald; they contain none but fully winged females; in short, I have been unable, in any of the London collections, to procure a sight of the apterous or partially apterous form; and Westwood does not possess it at Oxford. Dale (*in litt.*) described his rudimentary female, as "rather shrivelled, and I should say was merely undeveloped;" and Nolcken was at first disposed to think that the rudimentary wings were attributable to accidental crippling, and were merely cases of stunted growth: but Brown, though at first surprised to see an apterous specimen, says that "it was subsequently

* M'Lachlan assures me that he remembers to have formerly seen an apterous, or nearly apterous, female of *Acentropus* in the British Museum, thus corroborating Hagen. I made two visits to the Museum last autumn in order to see it, but it was not to be found.

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discovered to be very easy to separate the female pupæ* from those of the male, by the external characters." I think, therefore, that we must take it to be a fact, that the wingless or stumpy-winged female is a natural form.

The mode of coition of the winged female does not appear to have been observed; but Reutti, as recorded by Heinemann, reports that the wingless female swims on her back under the water by night, that coition takes place in the water, the female laying hold of the male, and drawing him down with her.

Millière and Peyerimhoff (Mill. Iconog. iii. 161) are sceptical as to this, and, no doubt, it is, at first sight, improbable. But let us see if there be not some corroborative evidence.

In the first place, be it remembered, that the pupa is under water, so that the moths, both male and female, are born in the water. Then Kolenati says, "I saw one female dive, and crawl down the stem of the *Potamogeton*," and I shall, hereafter, have occasion to show that this was, in all probability, a winged female. Ritsema expressly mentions that the males settled on the water, "or on floating plants below." Brown saw the male "on one occasion deliberately enter the water, and after creeping down a pond-weed stem for an inch or two, it emerged again with unwetted wings; this act was probably done in pursuit of the virgin female;" and again, referring probably to this same occasion, Brown writes (*in litt.*, 5th Oct., 1871) "I have also seen the male deliberately enter the water, which must, I should think, be for no other purpose than that of searching for the apterous female." M'Lachlan informs me, that at Hampstead (where the only females captured were winged females), he frequently noticed that specimens drawn below the surface, either on the net, or on patches of floating weeds, came up again none the worse for their submersion. Barrett reports that, if accidentally immersed, they "took no notice whatever of the ducking." And Corbin says "it is truly a water insect, as often only its head is above the surface." It seems, indeed, to be common ground with all who have had frequent opportunities of observing it, that the male is constantly on, or (at least partially) in, the

* Westwood's drawings (mentioned at p. 130, n.) corroborate this.

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water. And Speyer has pointed out that several of the peculiarities of the male appear to have for their object the facilitating a short sojourn and an onward movement in the water. The front of the body, he says, is relatively very strongly built; the wings are narrow, pointed, firmly fastened, almost fin-shaped, and when at rest bent backwards, and the scales lie smoothly on, and are fixed uncommonly fast; and, finally, the large and long palpi would be a hindrance to motion under water if they had extended forwards instead of being directed backwards. In short, Speyer explains the peculiarities in mode of life and organization of *Acentropus*, by regarding it as the representative of an older branch of the original stock of moths, the other members of which branch have disappeared; the primitive insect forms must be sought in water, the atavi of the Lepidoptera rose from the water to the land, and adapted themselves to terrestrial and aerial life; and *Acentropus*, the most distinctly aquatic of all known moths, is, from this point of view, the primeval type, the nearest extant representative of the grand ancestor of all the Lepidoptera.

But to return from the region of speculation to the domain of fact, I say that, knowing what we do know of the habits of *Acentropus*, I have no great difficulty in accepting Reutti's account of the apterous female, or rather of the female with rudimentary wings, for it is of the intermediate form that Reutti speaks. And I go a step further—for if the winged male can exist under water, whether he voluntarily, as Brown thinks, descends like Orpheus in quest of his Eurydice, or whether, as Reutti records, he is dragged down by the female, like Hylas by the water-nymph, there can be no reason why the winged female should not have the same habit as her unwinged sister; it is less unlikely that the winged and unwinged should be two forms of the female of the same insect, having the same sexual habit, than that they should be the females of two different insects with males undistinguishable by the eye, one of which indulges in aerial, and the other in aquatic, copulation.

This brings me to the question which it is the main object of this paper to open for discussion; namely, how many known species are there of the genus *Acentropus?*

For six and twenty years after, Westwood mated *Acentropus* and *Zancle*, but one species of the genus was

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recognized. At the end of 1858, Kolenati published an account of his capture at St. Petersburg twelve years before, and having detected a minute difference in the shape of the wing-scales* from the shape as represented in Westwood's figure (Introd. ii. 409), he says that he attributes the disagreement to the wood-cut; "were this not the case, we must announce our forty-two examples as a new species, and name it *A. Newæ*,"† but he did, in fact, announce his Neva specimens as *A. niveus;* and it was not until 1860 that the second species *A. latipennis* was described by Möschler (and figured by Herrich-Schäffer in 1861). In 1863, Brown came to the conclusion that, under the name of *A. niveus*, at least three species were confounded, (1) *A. niveus*=*Garnonsii* of Curtis, (2) *A. Hansoni*, and (3) *A. Newæ*, of which it was thought probable *latipennis* would prove to be the female. In 1869, Nolcken, after discussing the subject at some length, remarked (Stett. Zeit. xxx. 279) that the separation of *A. niveus* into several species "rests upon the supposition that all the characters given in the different descriptions really exist in nature, and will stand examination. But it is not so; for after careful and close scrutiny of the specimens, I have found many erroneous statements, particularly in Kolenati's description and figure of *A. Newæ;*" and when, towards the conclusion of his paper (p. 282) he wrote, that the characters upon which *A. niveus* was to be divided into several species "have for the most part not been verified, and it has not been my fortune, by way of compensation, to find other

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* *Not* a difference between the outline of the wings, as Brown puts it (Nat. Hist. Tutbury, p. 401), judging, doubtless, from Kolenati's figure, which is erroneous.

† In the case of *Bardell* v. *Pickwick*, in Dickens' Reports, the following occurs:—

"What's your name, sir?" enquired the judge.

"Sam Weller, my lord," replied that gentleman.

"Do you spell it with a V or a W?" enquired the judge.

"That depends upon the taste and fancy of the speller, my lord," replied Sam, "I never had occasion to spell it more than once or twice in my life, but I spells it with a V."

Here a voice in the gallery exclaimed aloud, "Quite right too, Samivel, quite right. Put it down a *we*, my lord, put it down a *we*."

So with Kolenati's *Newæ*, "I spells it with a V."

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more positive ones," I confess I was not quite prepared for the conclusion, that it is "advisable provisionally to separate the forms from different localities," which separation Nolcken proceeded to make, as follows:—

(1) *A. niveus.* Paris. Female unknown.

(2) *A. Hansoni.* Female with ample wings.

(3) *A. Garnonsii.* Female wingless (or with rudiments ?).

(4) *A. badensis.* Lake of Constance. Female with short rudiments of wings.

(5) *A. germanicus.* Stralsund. Female unknown.

(6) *A. Nevæ.* St. Petersburg, in the Neva. Female unknown.

(7) *A. latipennis.* Both sexes with ample wings. From its colour, shape of wings, &c., certainly a good species.

Of these seven, he says, at least three may be regarded as certain and well-founded species.

In the same year (1869) Tengström indicated the Finnish form as *A. obscurus*, var. of *A. Nevæ*.

In 1870, Millière figured *A. niveus* and *latipennis* (Iconog. pl. cxv. f. 21, 22); and Knaggs inserted *A. niveus* and *latipennis* in his 'List of British Lepidoptera.' Finally, Staudinger and Wocke, in 1871, split the difference between Nolcken's three certain and seven possible species, and enumerated the five as follows:—

(1) ? *niveus*, Oliv., Latr.	Paris.
(2) *Hansoni*, Ste., Nolck.=*A. niveus*, Ste. Ill.	England.
(3) *Garnonsii*, Curt., Nolck.	England.
(4) *Nevæ*, Kol., Nolck.	St. Petersburg.
a. ? *badensis*, Nolck.=*niveus*, Hein. . .	Lake of Constance.
b. ? *germanicus*, Nolck.=*niveus*, Mill. (sp. diversa ?)	Pomerania.
c. var. *obscurus*, Teng.	Finland.
(5) *latipennis*, Mösch., Mill.	Sarepta, on the Volga.

I will make a few remarks upon each of these. And first I may say that the ? prefixed by Staudinger and Wocke to *A. niveus* is not unwarranted; for Stephens recognized the insect, not from Olivier's description, which was meagre enough, but from Latreille's abbreviation of that—"blanche, ailes ciliées; partie supérieure de l'abdomen obscure"—and to identify a species from such a description must be the merest guess-work. Westwood, however, tells us, that Haworth had a speci-

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men which was ticketted "*alba*, Oliv.;"* there is no *Phryganea alba* of Olivier, but *alba* is the first word of the diagnosis of *Phryganea nivea;* and I presume, therefore, there must have been an oral tradition attached to Haworth's, and, perhaps, other specimens, that they were the "frygane blanche" of the French authors, and by this means Stephens was satisfied that his *Acentria* was identical with Olivier's insect. Perhaps some of our friends on the banks of the Seine will take the pains to re-discover Olivier's *nivea*; as Millière says "it is hardly known in France." And, at all events until such rediscovery is made, it must remain a matter of considerable doubt what the *Phryganea nivea* really was. But if it was not identical with the species (or one of the species) of *Acentropus* which we have in this country, it has dropped out of knowledge altogether; it is a name, and nothing more.

Brown's view is, that Curtis's *Garnonsii* is the *niveus* of Olivier; he attributes to this species the specimens obtained by Dale and Curtis at Glanville's Wootton, and by himself at Burton-on-Trent; "the female (he says) is apterous." And speaking of *A. Hansoni*, he says that the female "so far from being apterous, is furnished with wings of twice the area of those of the male." Now Brown admits that, as regards the males of *Garnonsii* and *Hansoni*, "the difference is so slight, that, if specimens of the two species once become intermixed in the cabinet, it is almost impossible to separate them;" and I venture to say that, but for his belief that the female of one is always amply winged, and the female of the other always without wings, Brown would not have dreamt of regarding them as two species. The only ground alleged for separating the two is, that the males being indistinguishable, one has a winged, and the other an apterous female; the argument is, that at Glanville's Wootton and Burton only the apterous female is found, and at London and Reading only the winged female is found. And Speyer says the female seems to occur of two forms, "which, perhaps, belong to different species."

But is this the case? Let us look into this a little more closely. It is quite true that apterous females (or rather

* The identical specimen was exhibited by Westwood when this paper was read; it is unquestionably a male *Acentropus Garnonsii*.

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females with rudiments of wings, which, for brevity, we will call apterous*) were found at Glanville's Wootton; but it is equally true that winged females were found at Glanville's Wootton. Curtis and Dale took the two forms of female together; and though the London collections do not contain a single apterous specimen, there is no lack of amply winged females from Glanville's Wootton. Then, what is the state of affairs at Burton-on-Trent? Brown bred the apterous female, but never "had an opportunity of studying its habits in a state of nature;" in a recent letter, he writes, "I may further add, that it is my firm conviction that winged females, with wings so ample as those found in London, cannot exist amongst our examples without their having been seen." But to this I reply, that M'Lachlan has a female with wings as ample as any of those found near London, and this female, he assures me, was captured by himself, not in the Trent, it is true, but in the Canal, at Burton. So that in both the localities in England, in which the apterous females have occurred, the winged form has likewise occurred. It is true that (so far as I know) near London the apterous form, and on the Lake of Constance the winged form, has not yet been found; but negative evidence of this sort is of very slight value. Finally, Ritsema found a number of pupæ near Haarlem in 1870; from these only two females emerged, and one had rudimentary, the other well-developed wings. Was one of these *Garnonsii*, and the other *Hansoni?* two species out of the same batch of pupæ, or two forms of the female of one and the same species? There are females without any trace of wings, females with rudiments of wings, and females with ample wings; and if these forms occur together, and the males are all alike, it seems to me that we require something more than the difference in the alar development of the female sex, before we can assert that there is more than one species. I submit that unless some other distinction can be pointed out, beyond the greater or less growth of wing of the female sex, the old view is the sound one, and Hagen was right when he regarded the winged and the unwinged females only as two forms of the same species.

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* "A semi-apterous form of the female," is M'Lachlan's expression (Intell. ix. 132).

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But it will be said there are other differences; and Brown describes the apterous female as being furnished "with long silky white fringes to its hinder tibiæ," from which he presumes it "to be endowed with active swimming and diving powers." But a reference to Brown's figures shows that the winged female has the tibial fringes as strongly developed as the wingless female, and that, so far, she is equally well endowed with swimming and diving powers, unless her wings act as impediment. As to this, I may recall Lubbock's exhibition of *Polynema fuscipes*, swimming by means of its wings (Proc. Ent. Soc. 1862, p. 93), a Hymenopterous insect with large fore-wings profusely fringed all round, whose motion through the water is due entirely to a sharp jerking action of the wings: and, to return to *Acentropus*, I have already suggested that the female which Kolenati saw descend into the water in 1846 must have been a winged female; but, however this may have been, it is abundantly clear, that the winged male can exist under water; and if the winged male, why not the winged female? if the winged male deliberately descends into the water in pursuit of the apterous female, why not also in pursuit of the winged female? With reference to these tibial fringes, I may mention, that not a trace of them was to be seen on the (winged) specimens which first came under my examination; I thought, therefore, that they might be confined to the apterous female, and that there might have been an error in Brown's figure of the winged female (figs. 7, 9). But in reply to enquiries, Brown informs me that a winged female from London, now in his collection, "has the brushes at the present moment of full size as depicted." And I have since had the pleasure of seeing winged females from Cheshunt, which exhibit traces of the fringe, and a continental female of *A. latipennis* which shows it quite prominently.* It seems clear, then, that like the leg spurs of the male, these fringes are easily deciduous: but if so, how about their use in swimming?

I pass on now to *A. Nevæ*, of which I have seen specimens given by Nolcken to Stainton. Judging from

* Nolcken thought he saw a trace of the fringes on a *male* from Stralsund; but he could not feel certain about this.

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Kolenati's figure, which he reproduced, Brown thought this a distinct species. He says "the upper and under wings have different relative proportions, and the body is shorter and more hairy, whilst a very definite difference exists in the two blunt teeth on the hinder tibiæ, of which I cannot detect any trace in *A. niveus*." To which I may add that in Kolenati's figure the cell of the hind-wings is represented as open; and Kolenati, as a Trichopterist, would naturally be supposed to pay particular attention to neuration. Now Curtis's figure of *Garnonsii* distinctly represents the hind-wings, as well as the fore-wings, with a long closed cell; Westwood's wood-cut, and Brown's two figures, all agree in showing a closed cell in both pairs of wings. Heinemann places *Acentropus* in the *Botidæ*, and gives "hind-wing-cell closed," as one of the characters of the family. Nolcken finds numerous errors in Kolenati's description and figure, though I cannot find that he specifically mentions the open cell. Speyer (whose specimens were from the Neva) says, that the wing-veins are very inaccurately figured by Kolenati; but expressly adds "the central cell of the hind-wings is open:" yet he says, that Heinemann's description is accurate, and that Westwood's figure agrees with his specimens! The difference between a closed cell and an open cell, if constant, would be a generic, if not a familiar distinction: but in truth, it is not constant, but merely accidental: the closed cell is the normal form of the hind-wing, and just as Kolenati and Speyer happen to have alighted on a specimen in which the hind-wing-cell was open, I have found one, and one only, which seems to present the same aberration. With regard to the different proportions of the wings, not one of Nolcken's one hundred and fifty specimens from the Neva agreed with Kolenati's figure; they had the same shape and relative size as the specimens from the Bodensee and other localities. Again, Nolcken was unable to discover the two blunt teeth depicted by Kolenati on the hinder tibiæ of *A. Nevæ*, and nobody else has had any better success, so that I think this must be taken to be one of the numerous inaccuracies of Kolenati's figures, unless, indeed, Kolenati detected the spurs on the hind-tibiæ, and these teeth are a rough and inaccurate representation of the spurs. But to pass from Kolenati's figures to his own words: he says that "in Westwood's wood-cut, everything agrees well with our examples" except the

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form of the wing-scales; and Nolcken says that the shape of the scales, as figured by Kolenati, is not true to nature. Speyer points out that Westwood (Introd. ii. 324) expressly denies the existence of the inner spine or appendage to the fore-tibiæ which he observed in *A. Nevæ*, and adds, "Since all my specimens show it, this circumstance is only explicable to me by the supposition, that the English species is not identical with that of the Neva. Westwood's other characters, as well as Stainton's short description, certainly as to the rest agree very well with Russian examples." But surely where the spurs on the mid- and hind-tibiæ have been looked for in vain by so many observers (including Speyer himself, at the time he penned the sentence I have quoted), it is too much to say that, because Westwood's specimen did not exhibit this minute appendage to the fore-tibiæ, therefore *A. Nevæ* must be a different species from his. Be it remembered, too, that out of all the specimens from the Neva, nobody but Speyer has ever been able to detect this object; though told what to look for, I cannot find it on any English specimen; but it seems far more likely that this appendage, like the other leg-appendages, is deciduous and easily lost, than that there should be two species, alike in everything else, down to the minutest particular, but distinguished, one by the possession, and the other by the absence, of this spine. In truth, this difference, if it really existed, would be something more than a specific difference, it would be a generic distinction. And the same remark applies to the ocelli; Nolcken mentions the ocelli of *Nevæ* as if their presence would serve to distinguish it from the English species, apparently forgetting that both Curtis and Stephens say "ocelli two," so that there is, at least, as much evidence in favour of their existence in *Garnonsii* and *Hansoni* as in *Nevæ*; at the same time, Nolcken doubts the existence of any ocelli in *Nevæ*, and considers that Kolenati was in error. But again I say, this difference, if it really existed, would be a generic, not a specific distinction; and, for myself, I cannot doubt, that if one *Acentropus* has ocelli, they all have. In 1864, after an abstract from the Natural History of Tutbury, Newman (Zool. 8920) said, "the species *A. Nevæ*, distinguished by the broad velvet-umber belt round the abdomen, is the one most commonly seen in cabinets; the beautiful belt has been mistaken for *grease*

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by some of our entomologists;"* I presume this refers to English cabinets, at all events it is true that most of the English specimens have the middle segments of the abdomen darker than the rest, but I feel confident that no one who examines a series of *Acentropus* would think of resting a new species upon that alone. The value, however, of Newman's note is, that he recognizes the Neva insect as an English species, and the one most commonly seen in our Cabinets. Hagen had previously told us (Stett. Zeit. 1859, p. 203) that specimens from England were identical with one of Kolenati's specimens from St. Petersburg which was sent to him, and that Kolenati's doubt on the subject was unfounded. Lastly, Heinemann cites Stainton's insect and Kolenati's insect as identical with what he calls *A. niveus;* and Snellen (Tijd. voor Ent. 1871, p. 170) considers that the Dutch specimens agree perfectly with English examples, and with those collected by Nolcken in the Neva, and that the whole are referable to one and the same species.

Of *A. Nevæ* Nolcken says "female unknown," and this is true. But Kolenati says, "I saw one female dive and crawl down the stem of the *Potamogeton.*" Now this was in 1846, ten years after Stephens in his 'Illustrations' had given the winged *Hansoni* as the female of *niveus,* and eight years before the existence of an apterous female was dreamt of. Under these circumstances, I think we may fairly infer that the female which Kolenati saw was a winged female: had it been apterous, so startling a novelty would scarcely have been unnoticed. Even when writing his account of the insect (which was not published till 1858), Kolenati would seem to have been unaware of Curtis and Dale's discovery of the apterous female in 1854, and the record thereof in our 'Proceedings' may well have escaped his notice; whilst Brown's history of the genus was not given to the public until 1863, and then in the form of an Appendix to a local Natural History, so that it was scarcely likely to attain that extended circulation on the Continent which the interest attaching to its contents rendered so desirable.

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* For instance, by Newman himself: "it is curious that the basal segments of *Acentria nivea* become greasy very shortly after the insect has been shut up in a camphored drawer" (Zool. 5629). I apprehend that the beautiful belt is Olivier's "partie supérieure de l'abdomen un peu obscure."

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The *A. badensis* of Nolcken, of which I have seen a male sent by Reutti to Stainton, is the insect given as *niveus* by Heinemann, who treats *Nevæ* as identical therewith; and as the only locality mentioned by Millière for his *A. niveus* is the Lake of Constance, I should have thought that his fig. 20 represented *badensis*, but according to Staudinger and Wocke it represents *A. germanicus*, if not a "species diversa," distinct (I suppose) not only from *germanicus* and *badensis*, but from *Nevæ* also. As to *badensis*, Nolcken says, "the female has short rudiments of wings, so that this species cannot be identical with the English species, which has a wingless female;" we have seen that many of the English females have short rudiments of wings, but on this point I refer back to what I have said under the head of *Garnonsii* and *Hansoni*. He also remarks that the absence of the long hairy fringes of the hind tibiæ (for he cannot believe that Heinemann would have overlooked them) distinguishes it from the English species; but the caducity of these fringes has already been referred to, and doubtless Heinemann does not mention them for the same reason that every author except Brown has omitted to mention them. Lastly, Nolcken says that the absence of the two teeth on the hind-tibiæ of the male distinguish it from *A. Nevæ*, but as he himself, like everybody else, has been unable to discover these teeth anywhere but in Kolenati's figure, it is rather too much to adduce their absence as a proof of the distinctness of *badensis*. And as Staudinger and Wocke do not consider *badensis* entitled to specific rank, I think we shall not go far wrong in agreeing with them on this point.

The *A. germanicus* of Nolcken, from Pomerania, must be the insect which Zeller had in numbers (Stett. Zeit. 1867, p. 192) without its occurring to him that it was specifically distinct, and as Nolcken gives no reason for regarding it as distinct, I again agree with Staudinger and Wocke in refusing it specific rank. I am unable to make out why Staudinger and Wocke consider Millière's *niveus* to be Nolcken's *germanicus*, and not *badensis*.

There remains only *A. latipennis*, of which Knaggs has lent me a continental pair (♂ and ♀) sent to him by Staudinger. Möschler himself says, that *A. latipennis* "cannot easily be distinguished from *A. niveus*:" the only distinctions which I can gather from his description

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are a slight difference in the length of the antennæ, some difference in colour and size, and the broader, rounder wings. "Both sexes with ample wings; by its colour, shape of wing, &c., a good species," says Nolcken. Herrich-Schäffer figured the original specimen, but his figure does not throw much light upon the subject: he mentions, however, that the palpi [of the ♀] are much shorter than in *niveus* [♂], the legs so far anomalous that the tibiæ of the four hindmost and the tarsi of the middle ones have long hairs [this is not peculiar to *latipennis*], and the thighs of the hindmost pair are only a little shorter than their tibiæ; also the antennæ are shorter, thinner, and scarcely perceptibly ciliate. I cannot find any published description of the male of *A. latipennis*. Millière's figures are too small to be of much use, and they are erroneous in the neuration of the hind-wings; but they are characteristic, and show the difference in the shape and outline of the wings very well; I imagine, however, that his fig. 21 represents a ♀ *latipennis*. The only recorded locality on the Continent for *A. latipennis* is Sarepta, on the Volga; but Knaggs has introduced the name into his 'British List,' manifestly considering it to be identical with the Hampstead form with the winged female. And of this, I think there is no doubt. An examination of the specimens sent by Staudinger shows that the female *latipennis* is only our old friend, the *Zancle Hansoni* of Stephens; in other words, Möschler's insect is identical with our London insect with the amply-winged female.

To slight differences in colour and size, I attach no importance. Hagen mentions that the colouring of the male *Acentropus* is variable in Prussia, the fore-wings being sometimes more and sometimes less flushed with brown (Stett. Ent. Zeit. 1859, p. 203), and he refers (*ib.* 1870, p. 316, n.) to specimens from Russia and East Prussia which had the wings marked with brown. Tengström (Not. Faun. Fenn. Förh. 1869, p. 324) says that Reuter captured specimens of *A. Nevæ* which in colouring resembled *latipennis*. And Ritsema (Tijd. voor Ent. 1871, p. 34, n.) reports that "the colour varies between snow-white and gray." I have not seen any specimen which could be appropriately described as snow-white; but I do observe differences both in colour and size in our English insects. These differences, however, do not

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serve to distinguish *latipennis* (*Hansoni*) from *niveus* (*Garnonsii*), but are common to both forms; the English *latipennis* exhibits as great a range of variation, both in size and colour, as the English *niveus;* specimens from Cheshunt are precisely like those sent by Staudinger, and of the uniform dull tint depicted by Herrich-Schäffer, whilst others from Hampstead are of lighter hue, and prettily mottled, or flushed with deeper brown. The important point is, undoubtedly, the broader rounder wing of *A. latipennis,* and though the winged females agree well with one another, from whatever locality they come, there certainly is a difference in the shape of the wings of the male, which is very perceptible when the narrowest and the broadest winged specimens are contrasted; and some of the Hampstead examples are larger insects, and have even broader wings than the Continental *latipennis,* differing in this respect as much from *latipennis* as the latter does from *niveus.* But other males captured at the same time and place, and specimens taken elsewhere consorting with amply-winged females, exhibit the narrower wing which is supposed to distinguish *niveus;* and, in fact, there is every gradation, the extremes may be connected by intermediate forms, and I do not think the breadth of wing can be depended upon as a test of their specific distinctness.

If this be so, I submit that there is, after all, but one species of *Acentropus;* with a wide European range, and exhibiting perhaps slight modifications in different localities, but gradual modifications, the extreme forms being connected by intermediate links. Its geographical range extends from about 4° W. to 45° E. longitude, and from 48° to 61° N. latitude; even those who advocate the separation into several species admit that *A. Nevæ* ranges from the Gulf of Bothnia to the Bodensee, whilst *A. latipennis* occurs alike in England and South-Eastern Russia. And indeed, with the exception of the isolated Sarepta, on the Volga, there is a continuity about the localities which favours the idea of the unity of the species; thus starting from St. Petersburg, we pass along the North coast of the Gulf of Finland, then along the Prussian shore of the Baltic, and inland to Frankfort-on-the-Oder, then to Holland, England, France, and the southermost part of Baden or the northern confines of Switzerland. The insect is so insignificant in appearance that it may well be overlooked; if searched for, I have no doubt it would be found wherever a pond-weed grows.

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There is one point to which I have not referred, because no use has hitherto been made of it, for the discrimination of the supposed species of *Acentropus*. I mean the shape of the genital organs and anal appendages, in which Trichopterists so much delight. Nolcken finds fault with the figures given both by Kolenati and Brown; and they are certainly wanting in detail. Hagen and Douglas have remarked upon the certainty which an examination of these organs would give, but to arrive at this certainty it is desirable that fresh specimens should be examined. From such examination of a few dried-up examples as I have been able to make, I find nothing which, in my view, warrants any separation into different species; but with newly captured insects, the result might be different.*

Nolcken himself, to whom we are indebted for the greatest amount of subdivision, admits that amongst the males of all the forms reported to be *A. niveus*, he could not find any trustworthy differences. In the case of forms so nearly allied, I think the *onus probandi* ought to lie upon those who assert their specific distinctness. And believing that, by simply asking an abstract question, I am less likely to provoke investigation and discussion, than by expressing an opinion which can be contradicted and disproved, I will conclude by expressing an opinion—to which I am not wedded, and from which I shall be glad to be converted—but still an opinion founded on such evidence as I have been able to obtain, namely, that all the forms of *Acentropus* heretofore attempted to be distinguished are, in fact, referable to one and the same species, for which, in the present state of our knowledge, I shall retain the name that is in vogue, *Acentropus niveus*.

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* Since this paper was read, M'Lachlan has examined the anal appendages of specimens from various localities. See the result stated in the next following paper.

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The synonymy will stand as follows :—

LEPIDOPTERA PYRALIDINA.

Fam. ACENTROPODIDÆ.

Acentropidæ, Stephens, Ill. Mand. vi. 150 ; *Acentridæ*, Speyer, Stett. Zeit. 1869, p. 405.

The name *Acentropidæ*, which Stephens first applied to the family, (though formed on the analogy of *Megalopidæ* from *Megalopus*, which had the sanction of no less an authority than Lacordaire), has been amended into *Acentropodidæ*; for this sesquipedalian word Speyer proposes the shorter *Acentridæ*. For myself, I prefer to take the name of the family from that of the typical genus. Moreover, the inappropriateness which modern discovery has shown to exist in the word *Acentropus*, though an insufficient ground for displacing a name that has obtained currency for forty years, is a sufficient ground for declining to admit the new name *Acentridæ*, which is just as inappropriate as *Acentropus*.

Gen. ACENTROPUS.

Acentropus, Curt. Brit. Ent. xi. 497. (*Acentria*, Ste. Cat. 316; *Zancle*, Ste. Nomencl. 118).

Sp. 1. ACENTROPUS NIVEUS.

Phryganea nivea, Oliv. Enc. Méth. vi. 536, 549 (1791). ♂.

Acentria nivosa, Ste. Cat. 316 (1829). ♂, sine descrip.

Zancle Hansoni, Ste. Nomencl. 118 (1833). ♀ alis amplis, sine descrip.

Acentropus Garnonsii, Curt. Brit. Ent. xi. 497 (1834). ♂; Proc. Ent. Soc. 1854, p. 24, ♀ alis abortivis.

A. niveus, Ste. Ill. Mand. vi. 150 (1836). ♂, ♀ alis amplis.

A. Nevæ, Kol. Wien. Ent. Monats. ii. 381 (1858). ♂.

A. latipennis, Mösch. Wien. Ent. Monats. iv. 55 (1860). ♀ alis amplis.

A. badensis, Nolck. Stett. Ent. Zeit. xxx. 283 (1869). ♂, ♀ alis abortivis.

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A. germanicus, Nolck. Stett. Ent. Zeit. xxx. 283 (1869). ♂.

A. obscurus (var.), Teng. Not. Faun. Fenn. x. 324 (1869). ♂.

Hab.—France (Paris, *Olivier*).

England (Greenwich, *Stephens*; Reading, *Hanson*; Colchester, *Garnons*; Glanville's Wootton, *Curtis*, *Dale*; Burton-on-Trent, *Brown*, *M'Lachlan*; Hampstead, *Knaggs*, *M'Lachlan*, *Wormald*, *Piffard*; Lewisham, *Stainton*; Horning Fen, *King*; Wicken Fen, *Bond*; Haslemere, *Barrett*; Ringwood, *Corbin*; Oatlands, *Stevens*; Cheshunt, *Boyd*; Regent's Park, London, *Dunning*).

Scotland (*Leach*, according to Curtis and Stephens).

Russia (St. Petersburg, *Kolenati*, *Nolcken*; Helsingfors, *Palmén*; Pargas, *Reuter*; Abo and Nyland, *Tengström*; Sarepta, on the Volga, *Möschler*).

Germany (Greifswald, *Zeller*; Stralsund, *Hering*; Lenz, *Hagen*; Frankfort-on-the-Oder, *Zeller*; Bodensee, *Reutti*, *Heinemann*, *Millière*).

Holland (Leyden, *de Graaf*; Haarlem, *Weyenbergh*, *Ritsema*).

The following is a chronological list of the authors to whom I have referred:—

1791. Olivier, Enc. Méth. vi. 536, 549. *Phryganea nivea.*

1805. Latreille, Hist. Nat. Ins. xiii. 93. *Phryganea nivea.*

1829. Stephens, Syst. Cat. 316. *Acentria nivosa* (sine descrip.).

„ Curtis, Guide, 137. *Acentropus Garnonsii* (sine descrip.).

1833. Stephens, Nomencl. 118, ed. 2. *Zancle Hansoni* (sine descrip.).

1834. Curtis, Brit. Ent. xi. pl. 497. *Acentropus Garnonsii.*

1835. Westwood, Tr. Ent. Soc. i. 117.

1836. Dale, Naturalist, i. 14.

„ Stephens, Ill. Mand. vi. 150. *Acentropus niveus.*

1837. Curtis, Guide, 172, ed. 2.

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1840. Westwood, Introd. Mod. Classif. Ins. ii. 324, 412; and fig. 113, 11-17.

1843. Boitard, Nouv. Man. d'Ent. iii. 130. *Phryganea nivea.*

1845. Westwood, Brit. Moths, ii. 257. *Acentropus niveus.*

1848. Kolenati, Gen. et Sp. Trichop. i. 6.

1852. Walker, Cat. Neurop. Brit. Mus. i. 136.

1854. Curtis, Proc. Ent. Soc. p. 24.

1856. Brown, Intell. i. 171.

1857. Douglas, Intell. ii. 59.

,, Newman, Zool. p. 5629.

,, Westwood, Proc. Ent. Soc. p. 76.

1858. Stainton, Ent. Ann. p. 102, f. 6. *Acentropus niveus.*

,, Brown, Zool. p. 5919.

,, Kolenati, Wien. Ent. Monats. ii. 381, pl. vii. *Acentropus Nevæ.*

1859. Hagen, Stett. Ent. Zeit. xx. 203.

,, Stainton, Manual, ii. 145. *Acentropus niveus.*

1860. Möschler, Wien. Ent. Monats. iv. 55. *Acentropus latipennis.*

1861. Herrich-Schäffer, Neue Schmett. Eur. iii. 123, fig. 155. *A. latipennis.*

,, Scott, Intell. ix. 125.

,, M'Lachlan, Intell. ix. 132.

,, Westwood, Intell. ix. 148.

,, M'Lachlan, Intell. ix. 156.

,, Newman, Zool. vol. xix. preface.

,, M'Lachlan, Zool. p. 7614.

,, Knaggs, Proc. Ent. Soc. p. 19.

,, Westwood, Report of Thirtieth Meeting of British Association, Transactions of the Sections, p. 123.

,, Wocke, Cat. Lep. d'Eur. p. 85. *A. niveus* and *A. latipennis.*

1862. Cooke, Zool. p. 8085.

,, Newman, Zool. p. 8216.

,, Westwood, Proc. Ent. Soc. p. 101.

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1863. Brown, Nat. Hist. Tutbury, 393. *A. niveus, Hansoni,* and *Nevæ.*

1864. Newman, Zool. p. 8917.

„ Hagen, Verh. zool.-bot. Ges. Wien. xiv. 800, 865.

1865. Heinemann, Schmett. Deutschl. II. i. 2, p. 107. *A. niveus.*

„ M'Lachlan, Tr. Ent. Soc. III. v. 169.

1867. Zeller, Stett. Ent. Zeit. xxviii. 192.

„ Barrett, Ent. Mo. Mag. iv. 182.

1869. Nolcken, Stett. Ent. Zeit. xxx. 275. *A. niveus, Hansoni, Garnonsii, badensis, germanicus, Nevæ,* and *latipennis.*

„ Speyer, Stett. Ent. Zeit. xxx. 400.

„ De Graaf, Tijd. v. Ent. II. iv. 203.

„ Tengström, Notis. Faun. Fenn. Förh. x. 324, 358. *A. Nevæ,* var. *obscurus.*

1870. Speyer, Stett. Ent. Zeit. xxxi. 202.

„ Hagen, Stett. Ent. Zeit. xxxi. 316, n.

„ Douglas, Ent. Mo. Mag. vii. 43.

„ Millière, Iconog. de Chenilles et Lep. iii. 160, pl. 115, f. 20, *A. niveus,* f. 21, *A. latipennis.*

„ Knaggs, Cab. List of Lepid. of Gt. Britain and Ireland. *A. niveus* and *A. latipennis.*

1871. Wocke, Cat. Lep. d'Eur. p. 216. *A. niveus, Hansoni, Garnonsii, Nevæ, latipennis.*

„ Ritsema, Tijd. v. Ent. II. vi. 34, 157.*

„ Corbin, Entom. v. 421.

„ Knaggs, Lepidopterist's Guide, 68, 82, 86.

1872. Newman, Entom. vi. 10.

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* I am informed, April 10th, 1872, by the author of the "Geschiedkundig Overzigt van het Geslacht *Acentropus,*" that a continuation thereof is in the hands of the editors of the "Tijdschrift voor Entomologie."

And in the "Petites Nouvelles Entomologiques" for April 15th, is a note by Ritsema, in which the author reiterates the opinion that there are but two known species of *Acentropus, A. niveus* and *A. latipennis,* "the latter having been met with only in Southern Russia." From what has been said above, it will be seen that this is not correct; *A. latipennis*

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having been captured in England, quite as frequently as *A. niveus*. I am quite in accord with Ritsema when he says that *A. Hansoni*, *Garnonsii*, *Nevæ*, *badensis*, and *germanicus* are not specifically distinct from *A. niveus*; but I go a step further, and say that *A. latipennis* is identical with *A. Hansoni*.

With reference to *A. obscurus*, Ritsema appears to think that Tengström described it as a new species, and that Wocke has reduced it to the rank of a variety of *A. Nevæ*; the fact is, however, that Tengström never regarded *A. obscurus* as anything more than a variety of *A. Nevæ*, and he expressly described it as such.

Ritsema expresses surprise that Staudinger and Wocke have not adopted the name *Acentropidæ* for the family; but when the derivation of the word *Acentropus* is remembered, it is at once seen that there is no ground for surprise, and that the change of *Acentropidæ* into *Acentropodidæ* is only in accordance with the orthographic system which Wocke has followed throughout his part of the Catalogue. For instance, the familiar *Pyralidæ* have on the same principle been converted into the *Pyralididæ*. Staudinger on the other hand has retained the familiar *Pieridæ*, which, had it occurred among the Micro-Lepidoptera, would, I suppose, have been written in its correct form of *Pieridídæ*.

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VIII. *On the external sexual apparatus of the males of the genus* Acentropus. By Robert M'Lachlan, F.L.S., Sec. Ent. Soc.

[Read 1st April, 1872.]

At the Meeting of this Society held on the 4th ultimo, my friend Mr. Dunning read a memoir (see preceding paper) on the genus *Acentropus*, which I propose to supplement by some remarks of my own, on points avowedly not investigated by him. Of the ordinal position of the genus I say nothing, except that I thoroughly agree with those entomologists who place it in the *Lepidoptera*, feeling sure that the few who appear to doubt the correctness of this opinion, can never have studied the characters, or, if they they have done so, maintain a factious opposition from pure affectation. As a Trichopterist, I assert that the attributes of the genus, its structure, larval characters, and, in fact, everything excepting its aquatic habits, are utterly opposed to its being Trichopterous, whereas there is nothing whatever incompatible with its ordinal position in the *Lepidoptera*.

Before proceeding to the subject of this paper, I will remark, *en passant*, concerning Mr. Dunning's observations regarding the existence or non-existence of ocelli. Kolenati asserted the presence of two undoubted ocelli in the ordinary position on the front portion of the vertex. I have no hesitation in declaring these ocelli to be fictious. At a *séance* alluded to by Mr. Dunning (see p. 129) at which he, myself, and Mr. Douglas were present, we subjected several examples to minute microscopic investigation, after having carefully denuded the heads of every vestige of scaly clothing. The result proved that in the position assigned by Kolenati, there were no signs whatever of ocelli either developed or abortive. But, in a slight depression on the outer side (that next the eye) of the base of each basal joint of the

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antennæ, there was seen a small rounded raised object, of polished texture, differing from the ordinary integument. If this be an ocellus, and I am not prepared to say it is not, then its position is at variance with anything yet recorded for these organs.

My principal object here, is to explain the results of an investigation of the structure of the external sexual apparatus in the males, and its bearings on the question of the supposed specific differences in the genus. And in making this investigation I entered a new field of enquiry, for this was my first essay at an examination of this apparatus in *Lepidoptera*. Many years occupied in analogous observations in *Trichoptera* and *Neuroptera*, have rendered me tolerably conversant with the infinite variety of forms to be found in the sexual parts of those insects, and have, probably, enabled me to form a tolerably correct idea of the amount of difference necessary to establish specific separation; but it is very possible that the same differences are not always present in *Lepidoptera*, and I am aware that the few Lepidopterists who have attended to this much neglected, though essential, part of their studies, affirm that these characters are more of generic than of specific value in that Order. On this point I am not competent to form any opinion, but having had the curiosity to carry my examination a little beyond the genus more especially under consideration, I have been amazed at the complex and beautiful structure revealed by denuding the scales of the anal extremities of various Lepidopterous insects.

In *Acentropus* I have endeavoured to make an examination of specimens from various localities. The only places in which I have personally found the genus are Hampstead near London, and on the Canal near Burton-on-Trent. Besides those, I have seen specimens from Ringwood in the New Forest, and from Cheshunt (taken by Mr. W. C. Boyd). Also individuals from Continental Europe sent by Dr. Staudinger to my friend Dr. Knaggs (to whom I express my obligation for the permission to make any use of the insects that I thought fit), consisting of two males (without female) sent as *A. niveus*, and a male (with amply-winged female) sent as *A. latipennis*. Of the English specimens all were accompanied by amply-winged females, excepting those from Ringwood, of which I have seen only males.

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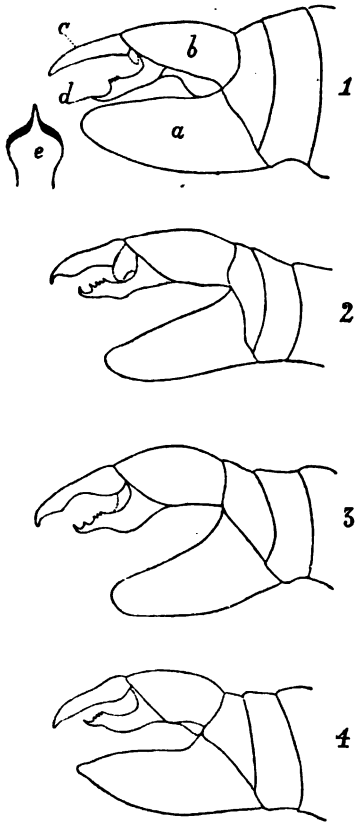
The general character of the anal appendages may be described as follows:—



(*Vide p.* 162.)

From the upper margin of the last segment proceeds a large boat-shaped lobe, which, however, when viewed from above, is longitudinally canaliculate in the middle, instead of being provided with a raised keel, hence the term 'boat-shaped' is only strictly applicable to its lateral aspect: this lobe is furnished with long scales proceeding mostly from its base. To the end of the lobe is attached a long, somewhat lanceolate, process, more or less pointed at its extremity, which is sometimes curved downward, and beneath, before the extremity, there is a tendency (not always appreciable) to a projection, in one specimen examined amounting to an actual tooth: on the base of the process there is possibly a membranous tooth-like structure, disappearing ordinarily by desiccation. The intromittent organ is attached to a membrane lying within, and connected with, the above-mentioned boat-shaped lobe. It is horny, and, viewed laterally, long and acuminate, the apex being acutely pointed and often mucronate. On the upper side, about the middle, there is a projection, or dilatation, furnished with more or less numerous, and more or less minute, teeth or serrations. Viewed from beneath, the apical portion of this organ expands, and is afterwards contracted and produced into a slender point. From the

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lower part of each side of the last segment proceed the enormous *appendices inferiores*, which are long and broad, extending nearly to a level with the apex of the superior process, spoon-shaped, concave within and convex without, and ending more or less obtusely.

The above observations, and the accompanying figures, have all been made by the aid of a $\frac{3}{8}$-inch power, with the compound microscope, and the camera lucida. The various parts lying nearly on one plane, and simple in structure, were the more easy to examine in this way; but much allowance must even here be made for the fact, that dry-insects only were examined, and for the difficulty of obtaining precise similarity of position and focal equality in microscopic manipulation as applied to these objects. In some individuals the various parts are closed one upon the other, rendering their discrimination impossible; in others, the intromittent organ is concealed under the superior process.

So far as I am aware, the only published figures or descriptions of this apparatus, are those by Edwin Brown, in Moseley's 'Natural History of Tutbury,' and by Kolenati (copied by Brown) in Wien. Ent. Monatsch. vol. ii. A comparison of their figures with those here given, proves that they were drawn roughly without sufficient magnifying power, the details of structure not being represented.

I now proceed to apply the results obtained from my investigations to the question of specific differences in the genus. Taking the *appendices inferiores* first, I find remarkable similarity in all the materials examined: but in Staudinger's ♂ of *A. latipennis*, and in some individuals (of *A. niveus*) from Ringwood, these parts are decidedly more acuminate, and more produced and acute at the apex, and this is even not sufficiently indicated in my figure, for, in consequence of the apex being somewhat incurved, it is much fore-shortened under a high power. The boat-shaped lobe does not show any important variation. The process extending from this lobe differs to some extent in the contour of its lower edge, viewed laterally; and in one example from Ringwood, there was even an evident subapical tooth-like projection. In Staudinger's examples of *A. niveus*, and in my own examples from near Burton-on-Trent, the extreme apex is curved downwards, and more acute. The intromittent

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organ presents decided, though small, differences in certain individuals. In Staudinger's examples of *A. niveus*, in those from near Burton-on-Trent, and from Ringwood, the apex is curved upwards into a small hook, and in these there is also an appearance of a larger tooth within the apex in front of the series of minute teeth on the median dilatation.

Mr. Dunning concluded his memoir by remarking, that he was inclined to the opinion, that there were not facts sufficient to justify us in considering that more than one species of *Acentropus* has been satisfactorily proved to exist, for which he retained the name '*niveus*.' The results of my examination of the genital apparatus, do not place me in a position to disagree with him. Certainly, there is nothing to justify the wholesale multiplication of species recently effected by Baron Von Nolcken. Yet I feel inclined to reserve any opinion on the matter when taken into consideration with the enormous discrepancy in the alar development of the females, about which there evidently exists some amount of mystery not yet unravelled. In the males, also, there is a very considerable difference in the form of the wings in individuals from different localities, though it may be that this difference may be better attributed to local than to specific influences. And, furthermore, I do not consider that sufficient attention has yet been paid to the characters presented by the genital apparatus in *Lepidoptera* to warrant us in assuming that in them, specific characters may always be as marked as they are in *Trichoptera*, &c.

The students of *Neuroptera*, using the term in its broad sense, have sometimes been twitted with the remark that they pay too much attention to these characters. This has never been said by a Neuropterist of a Neuropterist. In their Order each case is considered according to its merits. Large groups of species, *e. g.* the restricted family *Libellulina*, present scarcely any important differences in these characters in generic structure, and but slight specific difference; others show a constant specific difference in some portion of the apparatus; and there are, finally, many genera in which each species has an arrangement of parts totally different from that of its nearest allies. Thus wide specific difference may exist in other characters, combined with an inappreciable amount of it in these alone; but I have never yet found

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an instance of differences sufficient to be considered specific in the anal apparatus, without corresponding general discrepancies, though these latter are often difficult to explain in words. Local variation sometimes exists in the same species, and so does individual variation, and occasionally to an extent, in large insects, that would throw the small differences exhibited in the appendages of the *Acentropi* into the shade; but, nevertheless, the fact remains unassailable, that the most important organs, those upon which the perpetuation of the species depends, are those in which, as a rule, the best characters are found: and this latter remark obtains equally with regard to sexual appendages not immediately connected with the genital apparatus, for, in insects, domestication has not had an opportunity of forcing these peculiarities into abnormal development, nor, by altering the conditions of existence, of rendering them useless, and consequently aborted. In almost all orders of insects, sexual characters have been applied to specific separation with the best and surest results. Lepidopterists (with few exceptions) continue to allow the eye to be attracted by beauty of colour, or variation in design of markings, leaving more subtle characters neglected, either designedly, or because their examination, by rendering necessary the removal of the scales, makes the specimens "imperfect" as they term it. I venture to predict that the day is not far distant when coloured plates of butterflies, without details of structure, will be valued only as pretty pictures, comparatively useless for scientific purposes.

Explanation of the figures on p. 159.

Fig. 1. Lateral view of appendages of a male from Hampstead; *a*, appendices inferiores; *b*, boat-shaped lobe; *c*, superior process; *d*, penis;* *e*, apex of penis from beneath, more enlarged.

2. Example from Burton-on-Trent.

3. " " *A. niveus* (Staudinger).

4. " " *A. latipennis* (Staudinger).

* The teeth are somewhat exaggerated in all the figures.

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IX. *On the* Longicorn Coleoptera *of Chontales, Nicaragua.* By H. W. Bates, F.L.S.

[Read 6th May, 1872.]

The present paper is intended as an enumeration of the *Coleoptera Longicornia* of Chontales, in Nicaragua, with descriptions of the new genera and species, and is founded almost entirely on the collection made by Mr. Thomas Belt, in the neighbourhood of Santo Domingo, in that Province. In a letter describing the situation and physical geography of his collecting grounds, Mr. Belt writes as follows:—

"Santo Domingo is a mining village, situated on the head waters of one of the numerous streams that afterwards join and form the Blewfields river. It is nearly midway between the Atlantic and the Pacific, in lat. 12° 16′ N. and long. 84° 59′ W. The village lies just within the western edge of the great forest, which covers almost the whole of the Atlantic slope of Central America. The height above the sea-level is about 2,000 feet; but the ranges of hills around the village rise from 500 to 1,000 feet higher. To the eastward the forest continues unbroken to the Atlantic; but to the westward, at a distance of about seven miles, the lightly-timbered plains and savannahs commence, which stretch to the Lake of Nicaragua.

"The climate is humid; for nine months of the year rain falls nearly every day, and is often continuous for many days together; and during the other three months there are occasional showers, so that vegetation never dries up, but is always green and luxuriant. The rocks are ancient dolerites, much decomposed, and lying at low angles.

"The surface of the land in the forest region forms a succession of ranges and steep valleys, covered with magnificent timber and much undergrowth. Near the mines many clearings have been made, and the felled trees form the great places of attraction for Longicorns and other Coleoptera. Insects of all kinds abound, and as might be expected, insectivorous birds are also very numerous, both in species and individuals; so that I have observed their twitterings and cries here to a far

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greater extent than in other tropical forests in which I have wandered. Twelve species of humming-birds feed on the smaller insects; and trogons, motmots, with a great variety of other birds prey on the larger species. It is to this incessant persecution, I have no doubt, that the insect world owes the special means of protection, the mimicry and disguises, which are so extensively assumed; some being provided with stings and offensive flavours, and others mimicking these both in external appearance and movements."

As Mr. Belt's collections were thus made wholly in the forest region of the lower levels, and contain no mixture of the productions of the "tierra templada," or temperate zone of elevation, which forms so uncertain an element in collections from Mexico, and the Andean regions of South America; they ought to furnish a satisfactory means of comparing the insect fauna with that of various distant portions of eastern tropical America, such as the Amazons, South Brazil, &c. For, as almost the whole Atlantic slope of the Continent, from the southern to the northern tropic, is clothed with luxuriant forest, containing the same types of vegetation, and having a similar warm humid climate; and as, moreover, there exists no effective barrier to distribution, it becomes an interesting question how far the productions of the different portions resemble, or differ from each other. *Prima facie*, it would appear that the fauna ought to be almost the same throughout the whole area; and if there is great diversity, the causes of it form a problem of great importance. In such inquiries, however, we are always met, as regards Entomology, by obstacles caused by the fragmentary state of our knowledge. Some districts have been well, and others only superficially, worked. As regards Longicorn Coleoptera of Tropical America, we have a further difficulty, in the circumstance that a large number of species have been suffered to remain undescribed in collections, or, if described, are referred to wrong genera. At present, therefore, there is little to be done, except to describe new genera and species, and note some of the most obvious facts in the relations of the various faunas. Happily, the termination of Lacordaire's great revision of the genera of Longicornia enables us, at least, to refer the forms we have to deal with, with much greater certainty than before, to their natural place in the system.

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Mr. Belt has paid especial attention to the Longicorns, and his collections sent home to the present time contain about 250 species, of which 242 are enumerated in the following pages; several obscure forms standing over until the arrival of further material. An analysis of this department of the Fauna of Chontales gives the following results:—

Peculiar to Chontales	133	species.
Common to Chontales and Mexico	38	„
„ „ and the West India Islands	5	„
„ „ and the United States	5	„
„ „ and New Grenada or Venezuela	24	„
„ „ and the Amazon Region	22	„
„ „ and South Brazil	10	„
Generally distributed in Tropical America	5	„

No species is common to Chontales and the Old World.

With regard to these numbers, it cannot be denied that the proportion of species peculiar to Chontales (considerably more than one-half) would be much diminished if the productions of regions adjoining Central America were better known. On the other hand, many local and rare species no doubt remain to be discovered; so that a large amount of speciality in the Longicorn Fauna may be safely assumed.

With regard to the genera, a similar analysis brings into prominence the essential community of type of the Longicornia, throughout the Atlantic Slope of Tropical America. Out of 129 genera found in Chontales, no less than ninety-five are generally distributed over the whole area in question; and nine only are peculiar to the district. About ten, however, are distinguishable as north Tropical forms; *i. e.*, peculiar to Central America and adjoining region, inclusive of Mexico. These are *Braderochus*, *Strongylaspis*, *Callipogon*, *Mallodonopsis*, *Holonotus*, *Ornithia*, *Cœlarthron*, *Evander*, *Metaleptus*, and *Cirrhicera*. Several others might be added to this list, as having only straggling representatives beyond Central America and Mexico, where they exist in numerous species; such as *Stenosphenus*, *Ptychodes*, *Deliathis*, *Hammoderus*, and *Carneades*. Others extend further to the southward (*e. g.*, ten as far as Peru and the Amazon Region). Although so generally distributed within their area, scarcely any Tropical American genera

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are found beyond it; and only seven, out of the 129 Chontales genera, are found in the Old World.

Thus, two general facts of much interest, I think, are elicited by an analysis of Mr. Belt's collection of Longicornia, and there are abundant indications that other tribes of Coleoptera will, on examination, confirm them; these are, (1), the homogeneity of type of the insect fauna of the forest region of Tropical America, over probably forty-five degrees of latitude, with great local speciality; and (2), the existence of a distinct northern element whose metropolis is Central America. These results, I am strongly inclined to think, will not be invalidated by any increase of knowledge respecting the Insect Faunas of Tropical America.

Fam. PRIONIDÆ.

Parandra grandis, Thomson, Mus. Scientif. p. 790. —Found also in New Granada.

Parandra punctata, White, Cat. Long. Brit. Mus. p. 2. —Also in New Granada.

Parandra scaritoides, Thoms. Mus. Scientif. p. 82.—Also in New Granada.

Braderochus longicornis, n. sp.— ♂ Elongatus, angustatus, parallelopipedus, castaneo-fuscus, antennis corpore longioribus; thorace valde transverso, brevissimo, utrinque spinis longis tribus subæqualibus, supra minus grosse punctato-rugoso, fulvo-pubescenti; elytris medio vix latioribus, apice late rotundato, angulo suturali oblique spinoso, supra lævibus sericeo-nitentibus, humeris scabrosis, disco leviter tricostato; subtus sternis omnibus coxisque fulvo-pilosis.

Long. 1 unc. 11 lin.; lat. elytr. medio 6½ lin.

Distinguished from *Br. sulcicornis* (Lec.) and *Agyleus* (Buq.) *inter alia*, by the length of the antennæ which, in the ♂, exceed by one sixth the length of the body. As in both these species, the tibiæ are without spines, the femora scabrous, and the third antennal joint sulcate.

One example in Mr. Belt's collection. The *Derobrachinæ* are especially characteristic of the northern part of Tropical America; all the species, eight in number, inhabiting the region between New Granada and the

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southern part of the United States. None are yet recorded from Peru, Guiana, or Brazil.*

Callipogon barbatum, Fab. sp. Ins. I. 208.—This common Mexican insect occurs at Chontales as a local variety, in which the largest male individuals have the short thick mandibles of the medium developments of the Mexican form. The antennæ are also shorter. I am inclined to think the original Fabrician description refers to this form, obtained by Sir J. Banks from Honduras. If so, the Mexican form should take the name of *C. senex*, Dupont. Mag. Zool. 1832, pl. 33.

Strongylaspis scobinatus, Thomson, Classif. des Ceramb. p. 313; Chevrolat, Ann. Soc. Ent. Fr. 1862, p. 272.—Several examples. Found also in Mexico and Cuba. I have compared Chontales specimens with both Thomson's and Chevrolat's types now in the British Museum. The following appears decidedly distinct.

Strongylaspis bullatus, n. sp.—Multo brevior, elytris minus parallelus elongato subellipticus, fulvo-fuscus, pube vel lanugine decumbenti fulvo dense vestitus, thoracis disco antico plagis duabus parvis, elevatis, nigro-castaneis politissimis; scutello gibboso asperrimo; elytris, circa scutellum solum, aspere granulatis; antennis et pedibus nigro-piceis. Long. 12 lin. ♂.

One example in Mr. Belt's collection.

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* Six species are cited by Lacordaire (Genera, vol. viii. pp. 72-74); the eighth is the following:—

Braderochus inæqualis, n. sp.—♂ Elongatus, castaneo-fuscus, antennis corpore sexta parte brevioribus, thorace valde transverso, brevissimo, utrinque trispinoso, spina mediana valde abbreviata, anteriori sub-bifida; elytris mox pone humeros explanato-dilatatis, apice late rotundatis utrinque bispinosis, supra coriaceis et punctulatis, humeris scabrosis, disco leviter pluricostatis; subtus sternis coxisque fulvo-pilosis.

Long. 2 unc.; lat. elytr. 7½ lin.

Hab.—Guatemala. Doct. Candèze amicissime dedit.

By the sub-bifid form of the anterior thoracic spine, this species belongs to the same section as *Br. geminatus* (Leconte), but it differs widely in other respects; the thorax is very much broader and shorter, and the anterior spine does not project obliquely forward, besides being only imperfectly bifid, and the middle spine is reduced to a short tooth; the colour of the elytra is much darker, and they are less smooth and glossy; the two spines at the apex are nearer together. The antennæ are of nearly the same relative length. From *Br. longicornis* this species differs, besides other characters, in the elytra being broadest a little behind the shoulders, where the margins are dilated and flattened out. In *Br. longicornis* they are widest in the middle, and scarcely dilated.

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Mallodonopsis Mexicanus, Thoms. Classif. des Ceramb. p. 317.—The elytra are rather less punctured at the base than in Mexican specimens. *Mallodonopsis* resembles very closely the *Mallodons* of Tropical America, having the same elongate, scarcely convex form, and black or chestnut-brown colours. The species are doubtless found under loose bark of large felled trees; they differ from the Mallodontinæ in their roughened and spinulose femora and tibiæ, and in the much longer basal joint of the antennæ.

Mallodon spinibarbe, Lin. Syst. Nat. II. 624.—One male in Mr. Belt's collection, agreeing very well with others I have examined from Mexico, Cayenne, the Amazons region, and South Brazil. The species has a wide range, and the ♂ varies in the same locality in length of mandibles, form of thorax, and punctuation of the elytra. Both sexes may be distinguished by the angle of the cheeks projecting on each side as a *simple* tooth below the mandible. The smooth patches on the thorax in the ♂ are always well defined, and the interspaces are rugose-punctate. I believe several false species have been made upon insignificant varieties of this insect.

Mallodon angustatum, Thoms. Physis, I. p. 100.—This appears to be the common species at Chontales, which I refer to the above name with some hesitation, as the author does not notice the chief distinctive points. It is smaller and narrower than *M. spinibarbe*, with the thoracic patches in the ♂ less defined, and with the projection of the cheeks near the base of the mandibles bicuspid. Also found in Mexico.

Mallaspis Beltii, Bates, Trans. Ent. Soc. 1869, p. 49. —I have now seen a very large number of specimens of this species, all from Chontales. The male is always of a more or less light brassy-brown; the female is generally blueish-green, but rare varieties occur of brassy and coppery hues.

Mallaspis paradoxa, Bates, Trans. Ent. Soc. 1869, p. 383.—This remarkable species was described from what I indicated with doubt as the female. Since then I have received males from Mr. Belt, which differ little from

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the females described, except in the much greater length of the antennæ. The completed diagnosis of the species will run as follows:—

Antice et postice attenuata, subtiliter punctulata, fusca leviter æneo-tincta, apice pallidiori; thorace ante spinam valde attenuato, margine lævi absque carina, antennis violaceo-cupreis, apice rufescentibus.

♂. Antennæ corpore longiores, articulis linearibus 3-4 compressis, 4-11 subtus denticulatis.

♀. Antennæ corpore tertia parte breviores, articulis 3-6 compressis, omnibus angulis rotundatis, subtus brevibus.

Chontales: many examples. The form of the antennæ in both sexes is similar to that of the Mexican *M. longiceps*.

Holonotus nigroæneus, Bates, Trans. Ent. Soc. 1869, p. 57.—Apparently rare. Differs from other species of the same genus in the thorax being narrower than the elytra, and attenuated towards the head. The antennæ are strongly compressed, and not half the length of the body, but I suspect all the examples examined are females. The anterior and middle sterna are locked together by the projection of the mesosternum over the edge of the prosternum.

Othkostethus, nov. gen.

Sub-familiæ *Pœcilosominæ* pertinet. Corpus oblongum, modice convexum. Caput parvum, vertice canaliculato, fronte epistomateque profunde concavis, genibus brevissimis. Oculi reniformes, sat convexi, distantes, infra magni. Mandibulæ parvæ, curvatæ. Palpi breves, articulis terminalibus cylindricis. Antennæ ♂ corpori longitudine æquantes, robustæ, articulis 3-10 minute strigosis, opacis, apice intus dilatatis serratis, 1mo brevi. Thorax quadratus, valde transversus, lateribus utrinque æqualiter breviter tridentatis, margine posteriori medio rotundato-lobato. Scutellum breviter triangulare. Elytra ad basin utrinque in sinu marginali thoracis producta, apice obtuse late truncata, angulis breviter dentatis; supra grosse scabroso-punctata, utrinque 4-costulata. Prosternum ultra coxas haud productum, apice obtusum. Metasternum inter coxas intermedias productum, elevatum, conicum; mesosternum parvum, obtectum. Metasterni episterna parallela. Pedes et tarsi brevissimi.

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The species on which it is necessary to found the present genus, bears some resemblance to the males of small species of *Pyrodes, e. g., nigricornis;* but it differs totally from the sub-family *Pyrodinæ* in the form of the sterna, in which character it agrees best with *Nicias*. The thorax too is destitute of lateral serrature, having three small equidistant teeth. From *Nicias* it differs in the robust serrated antennæ.

Otheostethus melanurus, n. sp.—Rubro-fulvus nitidus, nudus; antennis, elytrorum triente apicali, tibiis et tarsis, nigris; capite thoraceque lateribus grosse rugosis, medio sparsim punctatis; elytris passim grosse confluenter punctatis; costula 1ma a lobo baseos, 2nda post humerum, 3ia et 4to infra humerum, incipientibus, his debilibus, ante apicem coeuntibus. Long. 7 lin. ♂.

One example, in Mr. Belt's collection.

Fam. CERAMBYCIDÆ.

Section A.

Eyes coarsely facetted. Habits nocturnal.

Malacopterus lineatus, Guérin-Méneville, Icon. R. A. p. 222.—Several examples, agreeing with a specimen from the Amazons taken by myself.

Genus Tristachycera, nov. gen.

♂. Corpus elongatum, subcylindricum. Caput breve, fronte verticali, brevissima, vertice inter antennas concavo. Mandibulæ brevissimæ, arcuatæ. Palpi omnes brevissimi, articulo ultimo penultimo angustiori, conico, truncato. Oculi valde emarginati, lobo inferiori modice convexo. Antennæ corpore dimidio longiores, filiformes, pubescentes, subtus dense longe ciliatæ; articulis 3-5 subtus apice breviter spinosis. Thorax inermis, ut in Gen. *Œme* postice dilatato, et basi subito constricto. Elytra thorace angustiora, apice rotundata, supra haud costata, confertissime punctata. Prosternum inter coxas latiusculum, elevatum, parallelum, longe ultra coxas prolongatum, apice obtusum. Mesosternum inter coxas magnas globosas depressum, angustum, lineare.

The remarkable insect on which this genus is founded has the metallic colouring of the *Xystroceræ*, but the general form, especially as regards the thorax, of *Œme*,

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The very short palpi and narrow, truncated, conical, apical joint amply distinguish it, independently of the antennæ, in which the basal joint is simply clavate (not spined as in *Xystrocera*) and the third, fourth, and fifth joints are a little swollen at their apices, extremely roughened, and having a short blunt spine a little longer than the other asperities.

T. viridis, n. sp.—Viridi-cyanea, supra subopaca, subtus viridi-ænea nitida, femoribus (apice nigris exceptis) rufis, antennis tibiis tarsisque nigris; capite grosse punctato-scabroso, thorace paulo inæquali, minutissime confertissime punctato, elytris grossius creberrime punctatis.

Long. 8½ lin. ♂.

One example, in Mr. Belt's collection.

Achryson surinamum, Lin. Syst. Nat. II. p. 632.

Var. *chontalense*. A typo differt thorace lineis indefinitis infuscatis, et elytris vitta laterali infuscata abbreviata.

This common tropical American species, which offers scarcely any variation from Buenos Ayres to Mexico, shows great instability in its dark brown markings at Chontales. In most of the examples I have seen of both sexes, the external end of the circumflex mark on the elytra is connected with a large subhumeral spot by a dusky vitta, which is sometimes prolonged nearly to the apex of the elytra. The thorax, in the darkest examples, shows two dusky stripes on the disc, united anteriorly. This variety is not constant, otherwise it would merit consideration as a distinct species.

Hammaticherus castaneus, Bates, Trans. Ent. Soc. 1870, p. 250; (*H. mexicanus*, Thoms. Classif. Ceramb. p. 196 ?). —Numerous specimens from Chontales exactly agreeing with those from South Brazil. The species has the greatest possible affinity with *H. batus* (Lin.) differing absolutely in colour only, the elytra in *L. batus* being slaty-black, and in *H. castaneus* of a tawny-chestnut hue. The denomination of local variety is scarcely possible in this case, one form being found near both the northern and the southern tropic, and the other in the intermediate region of Guiana and the Amazons. *H. Mexicanus*, Thoms., belongs possibly to this species, but his description is not quite applicable in several respects, and he compares it to *H. bellator*, an insect of different shape.

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Sphallenum robustum,* n. sp.—Subcylindricum, piceo-nigrum, elytris nigro-castaneis, femoribus (apice nigro exceptis) rufis; tuberis antenniferis intus cornutis; antennis basi robustis, pilosis, corpore longioribus (♂), thorace lateribus rotundatis, supra punctis grossissimis plagiatim dispositis, spatio dorsali lævi; elytris subtiliter coriaceis et punctulatis, apice utrinque æqualiter bispinosis; thorace infra grosse scabroso.

Long. 1 unc. 9 lin. ♂.

Similar to *S. puncticolle* (Bates) but stouter, elytra of a much darker castaneous colour, and thorax not tomentose.

One example, in Mr. Belt's collection.

Xestia pilosovittata, n. sp.—Magna, fusco-castanea, fulvo-griseo pubescens; capite grosse scabroso, linea elevata lævi, verticis usque ad occipitem extensa; thorace grossissime punctato-scabroso, plagis quinque discoidalibus lævibus, tuberculo utrinque laterali; elytris utrinque vittis quinque ochraceo-griseo-pilosis, quarum una suturali, duabus discalibus ante apicem conjunctis, alteris duabus lateralibus; apice utrinque fortiter bispinosis; subtus pubescens, abdomine maculis lateralibus et spatio mediano nudis; antennis pedibusque dense pubescentibus.

Long. 1 unc. 9 lin.

The antennal joints are linear, as in the species allied to *X. elegans*, and not serrate as in *X. spinipennis* and allies. The sockets of the intermediate haunches are a little open externally, and the species, so far, scarcely accords with the definition of *Xestia*; but the tibiæ destitute of apical spines, and the general form, agree very well with the genus. The dingy ochreous pubescence is coarse and decumbent, and the stripes of the elytra are each formed of two not well-limited lines. The femora are unarmed at their apices.

One example, in Mr. Belt's collection.

Xestia nitida, n. sp.—*X. spinipenni* (Serv.) similis, differt tegumento glaberrimo nitido; capite nigro, collo constricto, oculis magnis prominentibus, occipite transversim punctato-rugoso; thorace nigro, brevi, transverso, lateribus rotundatis, antice magis quam postice angustato, supra

* Bates, Trans. Ent. Soc. 1870, p. 253.

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acute transversim plicato: scutello nudo; elytris castaneis politissimis, apice utrinque bispinosis; prosterno ante coxas ut in *X. spinipenne* profunde bisulcato; corpore subtus pedibusque rufo-castaneis nitidis.

Long. 1 unc. 3 lin. ♀.

One example, in Mr. Belt's collection.

Xestia sagittaria, n. sp.—Nigra, polita, elytris ochraceis, vitta suturali, ad basin quadrato-dilatata et post medium iterum dilatata, sagittiformi, margine exteriori et maculis duabus marginalibus prope humeros, nigris; capite sparsim punctato, tuberibus antenniferis haud sulcatis, medio separatis et fronte bisulcata; thorace oblongo, lateribus vix rotundatis, supra tuberoso, sparsim irregulariter punctato; elytris passim æqualiter punctatis, sutura breviter spinosa; antennis articulis linearibus, compressis, supra leviter sulcatis; corpore subtus pedibusque nigerrimis politis, metasterni episternis tomentosis.

Long. 1 in. 1 lin.

A distinct and handsome species of the *elegans* (Gory) and *lateralis* (Erichs.) group. One example, in Mr. Belt's collection.

Gnaphalodes Trachyderoides, Thoms. Syst. Ceramb. p. 235.—Specimens taken by Mr. Belt at Chontales agree perfectly with Californian examples.

Pantomallus fuligineus, n. sp.—*P. villosicorne* (Lacord.) robustior, capite thoraceque multo latiores; cylindricus, fusco-obscurus, omnino fusco-griseo pubescens; thorace lato transverso, tuberculis duobus disci, alteraque utrinque laterali (ante spinam), nigris; elytris thorace vix latioribus, apice versus suturam oblique truncatis, angulo externo unispinosis, suprâ dimidio basali dense punctato, maculis eburneis geminatis nigro-cinctis duabus, primâ basali (geminis æqualibus), secundâ ultra medium (exteriore triplo majore); antennis robustis.

Long. 9-14 lin.

The ivory-like spots are much broader than in the other known species of the genus. The surface of the body is destitute of erect hairs. Apparently common at Chontales.*

Eburia proletaria, Erichs. (Fauna Coleop. Peruana, p. 140) and *E. morosa*, Serville, belong to the genus *Pantomallus*, which is distinguished

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Chlorida festiva, Lin. Syst. Nat. II. 623.—This widely-distributed and very common South American species occurs also at Chontales.

Chlorida cincta, Guér. Rev. Zool. 1844, p. 259.—Several specimens taken by Mr. Belt; elsewhere found hitherto only in Mexico.

Styliceps sericata, Pascoe, Trans. Ent. Soc. 2nd ser. V. 16. Bates, *ibid.* 1870, p. 263.—A specimen in Mr. Belt's collection of this Guiana and Amazons insect, is of a dark brown colour, instead of red; but with the same silky lustre.

Eburia pedestris, White, Cat. Long. Col. Brit. Mus. p. 88.—Apparently not uncommon in Chontales. Honduras, and Jamaica, according to White.

Eburia stigma, Olivier, Entom. No. 67, p. 126, pl. 23, f. 180.—One example in Mr. Belt's collection, agreeing perfectly with Olivier's excellent description. Found also in Cuba.

Eburodacrys Havanensis, Chevrolat, Ann. Soc. Ent. Fr. 1862, p. 267.—Several examples taken by Mr. Belt. Chevrolat records Cuba and Mexico as localities, and I have specimens also from Venezuela.

Eburodacrys callixantha, n. sp.—Minus elongata, claré fulvo-testacea, omnino erecté fulvo pilosa, thorace cylindrico, apud medium, et iterum apud marginem posticum, paulo dilatato, spinis lateralibus brevibus, supra irregulariter, dense subvermiculose, transversim, plicato, disco antico tuberculis duobus nigris: elytris apice transversim truncatis, angulo exteriore flavo-spinoso; supra, apice

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from *Eburia* by the angular extension, outwards, of the sockets of the anterior coxæ, and the unclosed sockets of the middle pair. The following, allied to *P. proletaria* is new:—

Pantomallus meridanus, n. sp.—Cylindricus, rufescenti-brunneus, fulvo-griseo pubescens et erecto-pilosus, thorace quam in *P. moroso* breviori, supra (cum capite) punctis magnis sparsis impresso, disco antico tuberibus duobus nigris; elytris cylindricis, apice breviter truncatis, haud spinosis, supra punctatis, utrinque maculis eburneis linearibus geminatis duabus, prima ad basin parva, exteriori longiori, altera post medium antice et postice striga nigra connexa, macula exteriori duplo longiori; pedibus rufo-testaceis. Long. 9 lin. ♂.

Merida, Venezuela, a Dom. Goering captus.

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lævi excepto, creberrime punctatis, maculis eburneis ellipticis tribus anguste nigro-cinctis, una ad basin, alteris duabus geminatis pone medium arcte conjunctis, quarum exteriori paulo longiori.

Long. 6½-8 lin, ♂ ♀.

I have seen many examples from Chontales, all of the same light clear tawny or yellowish-testaceous hue, the ivory spots elliptical, not linear, and narrowly edged with black.

Elaphidion irroratum, Lin. Syst. N. II. p. 633.—Several specimens taken by Mr. Belt, agreeing well with the figure given in Ramon de la Sagra's 'Histoire de Cuba,' Insects, pl. 10, f. 7. Found also in other of the West India Islands, and in Mexico.

Elaphidion coronatum, White, Cat. Long. Col. Brit. Mus. p. 100.—A handsome species closely allied to *irroratum*, but differing in its red colour, and the large patches of dense white pile on the head and elytra. Found, besides Chontales, in Guatemala and Honduras.

Hypermallus scabricollis, n. sp.—Subcylindricus, castaneo-fuscus, grosse sparsim pilosus, capite et thorace fulvo-lanuginosis, grossissime et creberrime punctatis, hoc cylindrico, linea abbreviata dorsali lævi polita; scutello dense fulvo-pubescenti; elytris apice sinuatim truncatis, utrinque bispinosis, supra grosse punctatis, versus apicem lævibus, pube decumbenti cinerea plagiatim irroratis; prosterno inter coxas elevato, apice verticali; mesosterno antice declivi; antennis densius pubescentibus, et infra ciliatis, articulis 3-6 apice unispinosis, 3 et 5 longitudine æqualibus, 4to tertia parte breviori; pedibus brevibus, rufo-castaneis, tibiis basi fuscis, femoribus apice inermibus.

Long. 7 lin. ♀.

One example. In shape resembling *H. inerme* (Newm.) of the southern States of N. America.

Trichophorus albisparsus, n. sp.—Angustus, cylindricus cinereo-pilosus, rufo-testaceus, elytris guttis parvis albis numerosis sparsis, capite macula frontali, thorace vittula utrinque discoidali, antice interrupta, albis; antennis articulis 3-5 apice spinosis; thorace dorso valde planato, creberrime punctato-rugoso, linea lata abbreviata dorsali

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lævi polita; scutello albo; elytris apice oblique truncatis angulo exteriori leviter dentato, supra passim punctatis.

Long. 5¼ lin. ♂.

One example of this very distinct species in Mr. Belt's collection.

The number of spines on the antennæ which Lacordaire (Genera, vol. viii. p. 316) believed to be a specific or sectional character in this genus, is really a sexual one in some cases. Thus, *Tr. albomaculatus* in the ♂ has only two spines, and in the ♀ six. In *distinctus* (Newm.) I find three in the ♂, and six in the ♀.

Peribœum villosulum, n. sp.—Quam *P. pubescenti* magis elongatum et parallelum, nigro-fuscum nitidum, passim longe griseo-hirsutum, antennis pedibusque testaceo-rufis; capite grosse punctato-rugoso: thorace capite vix latiori, elongato, medio paululum dilatato, haud spinoso, supra tuberibus vix elevatis quinque, mediano elongato, interstitiis grosse punctato-rugosis; scutello cinereo-tomentoso; elytris apice sinuatim truncatis, angulo exteriori longe spinoso, interiori producto acuto, suprá passim punctatis; prosterno medio late sulcato.

Long. 8 lin. ♂.

In Mr. Belt's and my own collection, as in all species of *Peribœum*, the thighs are abruptly clavate.

Peribœum bimaculatum, n. sp.—Rufo-testaceum, setis longissimis erectis vestitum, elytris medio macula lata, transversa, testaceo-alba, fusco-cincta; capite crebre reticulato-punctato; thorace elongato, medio dilatato, utrinque vix obtuse tuberculato, supra reticulato-foveato, linea dorsali abbreviata lævi; elytris haud linearibus, medio leviter dilatatis, deinde rotundato-angustatis, apice breviter truncatis, angulo exteriori breviter producto, suprá sparsim punctatis, punctis majoribus piliferis lineatim seriatis: antennis art. 3-5 spinosis, ♂ris spinis quam in ♀ brevioribus.

Long. 4-5 lin. ♂ ♀.

A pretty little species allied to *Nephalius Poeyi* (Sagra, Hist. de Cuba, pl. 11, f. 11), but having the thighs rather more abruptly clubbed, and the thorax not distinctly tubercled on each side. The white spots of the elytra are transverse, and separated only by the sutural border. The femora are without spines at the apex.

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Chontales, Mr. Belt. I have an example in my collection from Mexico.

Nephalius suturalis, Pascoe, Ann. & Mag. Nat. Hist. Ser. 3, XVIII. p. 479.—Found also in Venezuela.

Nephalius rugicollis, Guér. Icon. R. A. texte, p. 233.—Found also in New Granada.

Nephalius Xestioïdes, n. sp.—Magnus, cylindricus, castaneus nitidus, pilis erectis griseis sparsis; oculis maxime prominentibus; capite lævi, occipite haud profunde reticulato-foveato; thorace cylindrico, elongato, prope basin constricto, sparsissime punctato; elytris apice truncatis, angulo exteriori modice, interiori leviter, productis, suprá sparsissime punctatis, apice sublævibus; prothorace subtus transversim plicato, femoribus posticis elytris multo brevioribus (♀), omnibus gradatim clavatis, apice late bidentatis: tibiis carinatis; antennis (♀) corpore brevioribus, articulis 3-6 fortiter spinosis, articulis 3-10 supra vix carinatis.

Long. 1unc. 1 lin. ♀.

One example, in Mr. Belt's collection. Resembles in form and colour *Xestia spinipennis*.

Nephalius rutilus, n. sp.—Nitidus, sparsim erecto-pilosus, capite thoraceque rufis, elytris nigro-æneis; metasterno, abdomine, pedibus et antennis nigris, his extrorsum cinereo-sericeis; capite vix punctato; thorace medio paulo rotundato inermi, prope basin constricto, supra leviter quinque tuberoso, tubere mediano elongato, interstitiis leviter punctatis; scutello griseo; elytris recte truncatis, angulo exteriori spinoso, spina brevi obliqua, interiori leviter producto; antennis ♂ articulis 3-7, ♀ 3-9, apice spinosis; femoribus gradatim clavatis posticis ♂ corpore paulo superantibus, apice breviter bispinosis; prothorace subtus antice lævi, postice crebre punctato.

Long. 6-7½ lin. ♂ ♀.

Chontales. Many examples.

Miltesthus, nov. gen.

Corpus subcylindricum, dense punctatum et pubescens. Palpi longitudine æquales, late securiformes. Frons plana.

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Thorax elongatus, medio leviter dilatatus, ♂ inermis, ♀ spina distincta parva. Elytra ante apicem rotundata, apice utrinque emarginata. Antennæ ♂ corpore tertia parte longiores, ♀ corpori æquales; articulis 3-4 supra sulcatis et ♂ apice longe spinosis, in ♀ articulo 5 etiam longe spinoso. Acetabula intermedia extus clausa. Pedes robusti; femora abrupte clavata, apice haud spinosa; tibiæ haud carinatæ.

The only structural character which distinguishes the insect on which this genus is founded, from the other forms allied to *Sphærion*, is the absence of carinæ from the tibiæ; but this distinction is so strongly supported by difference of facies, that there can be no doubt of the necessity of the genus. The body is more convex, and more rounded towards the apex, and the whole surface thickly punctured, and pubescent without being opaque, as in *Sphærion* (*Mephritus*) *cinerascens*.

Miltesthus marginatus, n. sp.—Rufo-ochraceus, breviter cinereo-pubescens, elytris margine laterali et sutura plus minusve fuscis; capite dense æqualiter scabroso; thorace supra paulo inæquali, crebre grosse vermiculato-rugoso, linea abbreviata dorsali sublævi; scutello argenteo-tomentoso; elytris apice breviter sinuatim truncatis, angulis productis, suprá subgrosse, regulariter, discrete, crebre punctatis: prothorace subtus transversim plicato.

Long. 8½ lin. ♂ ♀.

Chontales. Many examples.

IRONEUS, nov. gen.

Peribæo similis, sed oculis minoribus, vix prominentibus, subtenue granulatis, supra angustis. Caput infrá oculos breviter prolongatum, vertice intra oculos paulo depresso; tuberibus antenníferis vix elevatis, antice emarginatis. Palpi paulo elongati, maxillares longiores, articulis ultimis modice dilatatis, truncatis. Antennæ (♂) corpore duplo longiores, setaceæ, subtilissime pubescentes, basin versus sparsim ciliatæ, articulis 3-10 longitudine subæqualibus, 3-5 apice breviter spinosis, supra carinatis. Thorax capite paulo latior, cylindricus, medio paulo rotundatus, inermis, supra lævis. Elytra modice elongata, postice attenuata, apice truncata et bidentata, supra regulariter modice punctata. Femora omnia subabrupte clavata, apice inermia; tibiæ posticæ extus carinatæ, tarsi breves. Acetabula antica extus clausa, intermedia aperta.

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Agrees with *Peribœum* in all its characters, except the much less coarse facetting of the eyes, and their much smaller volume and prominence. In this character it differs entirely from the subfamily, and even from the section to which *Peribœum* belongs. In some essential respects it resembles *Stenosphenus*, and in others *Allœsia*, of the sub-family *Heteropsinæ*, section B., but the carinated antennæ and tibiæ bring it within the definition of the Sphærion group.

Ironeus duplex, n. sp.—Elongatus, vix convexus, niger, sparsim subtenuiter griseo-pubescens, femoribus rufis: capite et thorace parce, antennarum articulo primo grosse, punctatis; elytrorum pubescentia erecta.

Long. 5 lin. ♂.

One example; Chontales

Mallocera spinicollis, n. sp.—*M. glaucæ*, Serv. similis, differt elytris utrinque unispinosis: minus elongata tomento sericeo cinereo-olivaceo vestita; thorace angusto, cylindrico, antice haud constricto, tuberculo laterali acuto, subspinoso, disco antico tuberculis duobus, lineolaque mediana, nigris, nudis; elytris desupervisis olivaceo-nigris, fasciis tribus argenteo-sericeis, 1ma prope basin ad sutura interruptâ, 2nda et 3ia pone medium, hâc ad sutura interrupta; femoribus basi castaneo-rufis, apice haud spinosis.

Long. 8 lin. ♂.

Agrees with *M. Amazonica* (Bates), in the unispinose apices of the elytra, but differs in the sharp lateral tubercles of the thorax, and other characters.

Chontales.

Hexoplon albipenne, n. sp.—Sublineare, capite, antennarum articulis duobus basalibus, et thorace, castaneis, politis, hoc lateribus obscurioribus; antennarum cæteris articulis, pedibus et elytris, albo-testaceis, his utrinque nigro-trimaculatis, maculis 1ma (prope basin), 2nda discoidali, linearibus, 3ia ante apicem triangulari, apice fortiter sinuatis et bispinosis; corpore subtus castaneo-nitido, pectore cinereo-hirto.

Long. 6 lin. ♂.

This elegant species appears rare in Chontales. The thorax is nearly perfectly cylindrical, and very little convex, very long and narrow, with the posterior constriction

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well marked, and the surface smooth and glabrous. The basal joint of the antennæ is rugose-punctate, and has a stout tooth exteriorly at its apex. The elytra are not raised posteriorly, and have a longitudinal depression along the suture, in which are three lines of setiferous punctures.

Octoplon glabriolum, n. sp.—Lineare, clare fulvum, nitidum, longe sed sparse pilosum; fronte haud armata, antennis linearibus impunctatis; thorace cylindrico, polito, antice et postice valde constricto, supra obtuse tuberoso; elytris thorace plus quam triplo longioribus, apice truncatis et unispinosis, supra, punctis sparsis setiferis exceptis, lævibus, macula rotundata alba, discoidali, ante, alteraque transversa pone, medium; femoribus modice clavatis, apice bidentatis.

Long. 5-6½ lin. ♂.

The whole upper surface of the body is highly polished, and the elytra are almost destitute of punctures.

Chontales.

Ibidion carinicolle, n. sp.—Cylindricum, minus angustum, fulvo-testaceum, unicolor, politum, breviter setosum; capite subtiliter scabroso, fronte breviter armata; antennis linearibus, articulo primo inflato-clavato punctato, 3-6 modice sulcatis, 4to haud abbreviata; thorace cylindrico, biconstricto, supra tuberoso, tubere centrali magno, elongato, interstitiis punctulatis et postice argenteo-tomentosis; elytris punctis setiferis distinctis, lineatim congestis, interstitiis punctulatis, apice breviter emarginato-truncatis, angulo interiori producto, exteriori spiniforme: femoribus fortiter clavatis, posticis (nec intermediis) apice bidentatis.

Long. 6½ lin. ♀ (?).

One example.

Ibidion griseicolle, n. sp.—Lineare, supra medio depressum, subopacum; capite ruguloso, rufo-testaceo, fascia verticis nigricanti, fronte armata; antennis linearibus, nigris, cano-pubescentibus, articulo primo tumide clavato, rufo; thorace cylindrico, supra ante basin sulcato, dorso transverse scabroso et trituberoso, cano subtiliter tomentoso nec setoso, marginibus antico et postico testaceo-rufis; elytris apice sinuato-truncatis, angulo interiori producto, exteriori longe spinoso, supra sub-dense breviter setosis,

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medio depressis, punctis setiferis basi asperatis, flavo-testaceis, vitta suturali basin haud attingenti, et longe ante apicem terminata, apice maculisque duabus elongatis marginalibus fuscis; pedibus, pectore et abdomine, canotomentosis; femoribus clavatis, apice breviter bidentatis.

Long. 6 lin. ♂ ♀.

Many examples. In colours of elytra, resembles *I. suturale* of White, which, however, has a shining thorax.

Ibidion textile, Thomson, Systema Ceramb. p. 573.——Apparently common in Chontales.

Ibidion Mexicanum, Thomson, Systema Ceramb. p. 573.—Also common.

There appears to be no constant difference between these two species, except the form of the apex of the elytra, which is rounded in *Mexicanum*, and unispinose in *textile*. I suspect this is either a sexual difference in this case, or a variable character; some specimens, in fact, are truncated at the apex, and thus intermediate between the two.

Heterachthes ditelus, n. sp.—Cylindricus, robustus, nitidus, setosus, rufus, capite (cum thoracis margine antico) et quarta parte apicali elytrorum nigris; capite lævi, fronte breviter armata; thorace cylindrico, lateribus medio tumidis, postice constricto, disco antico bituberoso, tubere centrali maxime elevato, interstitiis punctis setiferis sparsis; elytris dorso longitudinaliter depressis, sparsim confuse punctatis, apice late rotundatis vix truncatis; supra, margine antico nigredinis, apicalis fascia lata, obliqua, flava, maculaque simili discoidali ante medium; antennis filiformibus, articulis 3-5 robustis, nec carinatis, nec sulcatis, articulis basalibus nigris; femoribus modice clavatis, apice inermibus.

Long. 6½ lin.

One example. The species has no resemblance to others of the genus, and belongs to it only in the artificial system adopted by Lacordaire.

Heterachthes ebenus, Newman, Entom. p. 9.—A Chontales specimen differs only from the Florida species by a minute emargination of the apex of the elytra. It may probably be specifically distinct.

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Heterachthes nigrocinctus, n. sp.—Linearis, subdepressus, glaber, sparsissime setosus, castaneus, nitidus, antennis (articulis 1-2 exceptis) pedibusque flavis, elytris macula magna ante medium (suturam haud attingenti) et fascia obliqua mox assequenti testaceo-albis, læte nigro-marginatis; thorace angusto, cylindrico, lævi, supra vix inæquali; elytris subglabris; femoribus modice clavatis, apice breviter bidentatis.

Long. 4 lin. ♂.

One example.

Obrium albifasciatum, n. sp.—Fulvum, politum, capite densissime rugoso-opaco, antennis 3-4 basi albo-testaceis; thorace antice abrupte et fortiter dilatato, postice gradatim angustato, prope basin constricto, supra juxta dilatationem impresso, disco lævi convexo; elytris punctis perpaucis setiferis sparsis, pone medium maculis duabus transversalibus, albis, suturam haud attingentibus, primo triangulari.

Long. 3 lin.

One example.

Section B.

Eyes finely facetted (Diurnal).

Ophistomis Beltii, n. sp.—♀ Saturate flavus, aureo breviter pubescens, antennis, femoribus posticis apice, tibiis et tarsis, nigris; capite et thorace nigro-bivittatis, elytra sutura antica et utrinque maculis 4 nigris, prima angusta, callo humerali tegenti, 2nda paulo ante et 3ia longe post medium, transversis, 4ta apicali; capite antice longissimo, vertice grosse, collo subtiliter sparsim, punctatis; thorace et elytris nitidis, haud densissime punctatis; abdomine segmento ultimo nigro, infra simpliciter emarginato; antennis longitudine corporis, apices versus incrassatis.

Long. 7 lin.

In its slender shape, the single example of this fine species resembles the males of this genus, and its very long antennæ add to the resemblance; but the form of the last ventral segment shows it to be a female.

One example, in Mr. Belt's collection.

Ophistomis picticornis, Bates, Trans. Ent. Soc. 1869, p. 384.—Apparently not uncommon in Chontales.

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Ophistomis pallidus, n. sp.— ♀ Latus, robustus, postice vix attenuatus, melleo-flavus, nitidus, elytris (apice nigro-marginato excepto) sordide testaceo-albis; antennis (apice vix incrassatis) nigris, articulo basali subtus flavo; capite dense punctato, collo punctulato, medio sulcato; thorace crebre punctato, sparsim aureo-pubescenti; elytris apice late truncatis, utrinque breviter bispinosis, supra confertim punctulatis, punctulis nigro-setiferis; tibiis, tarsis, apiceque femorum (in anticis femoribus supra lineatis), nigris.

Long. 6½-7½ lin. Lat. elytr. 2-2⅓ lin. ♀.

Many examples, all females.

Ophistomis rufiventris, n. sp.— ♂. Brevis, postice valde angustatus, niger, vix nitidus, ventre sanguineo; capite dense punctato, antice minus elongato, sed parallelo; thorace grosse discrete punctato, linea dorsali lævi; elytris crebre discrete punctatis, apice oblique truncatis, extus dentatis; segmento ultimo ventrali late excavato, lateribus paulo elevatis.

Long. 6 lin. ♂.

A short, posteriorly tapering form, closely allied to *O. rubricollis*, Bates.

Mr. Belt's collection.*

Rhinotragus apicalis, Guérin, Icon. R. A. texte, p. 236. —One example. It is doubtful whether the species be the same as the Bolivian one described by Guérin, but the description, as far as it goes, agrees with it.

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* *Ophistomis rostratus*, n. sp.—Modice elongatus, postice attenuatus: niger, thoracis et elytrorum basi, pectore et abdomine, sanguineis; capite antice angusto, elongato, oculis multo minus prominentibus; thorace nitido, impunctato, ante medium paulo dilatato, elytris crebre sublineatim punctatis, apice oblique truncatis, angulo exteriori longe producto et acuto.

Long. 6 lin. ♀.

New Granada. I have seen a species similar to this, but distinct, in M. Boucard's Mexican collection.

Ophistomis fulvicornis, n. sp.—*O. gratæ* (Redtenb., Voy. Novara) affinis, ♂ testaceo-fulvus, corpore supra fusco-niger, fronte et marginibus posticis thoracis fulvis, elytris utrinque macula parva, rotundata, basali, duabusque angustis, ante et pone medium, sublateralibus (interdum absentibus) fulvo-testaceis; antennis articulis basalibus, metasterni medio, femoribus apice, tibiis et tarsis nigris. ♀ Elytra latiora. Thorax fulvus, disco utrinque macula elongata nigra, elytris maculis majoribus, basalibus et lateralibus, (his linea discoidali conjunctis) et fascia ante-apicali fulvis; pedibus antennisque totis fulvis.

Long. 6-6½ lin.

Brazil; Provinces of Espirito Santo, and Rio de Janeiro.

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Ommata Beltiana, n. sp.—Læte viridi-aurata, elytris basi fascia aurantiaca; linearis, postice angustata, capite grosse scabroso, thorace cylindrico, subelongato, transversim grosse rugoso-punctato; elytris crebre passim punctatis, apice oblique truncatis; corpore subtus pedibusque viridi-æneis, nitidis; antennis corpore brevioribus, robustis, apicem versus incrassatis; oculis distantibus; pedibus posticis valde elongatis, femoribus apice modice clavatis.

Long. 6½ lin. ♀.

This exquisite species is nearly allied to *O. aurata* and *smaragdina*, of the Amazons region.

Ommata cyanipennis, n. sp.—Atro-cyanea, elytris cyaneis, abdomine rufo; capite et thorace grosse punctato-scabrosis, hoc breviori, antice angustato, disco antico plagis tribus lævibus; elytris utrinque lateraliter obtuse carinatis, crebre ruguloso-punctatis, apice truncatis; oculis infra magnis, elongatis; pedibus posticis vix elongatis, femoribus gradatim clavatis.

Long. 4½ lin. ♂.

One example.*

Agaone monostigma, Bates, Trans. Ent. Soc. 1869, p. 384.—Two examples.

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* *Ommata atrata* (Dej.) n. sp.—Linearis, nigra, opaca; elytris, apice grisescentibus; capite crebre punctato, subnitido; thorace velutino, brevi, medio rotundato, antice angustato; elytris mox pone humeros angustatis, deinde usque ad apicem parallelis, apice late truncatis, supra lateraliter obtuse carinatis, grosse crebre punctatis; subtus et pedibus nitidis, femoribus posticis elytris brevioribus, gradatim modice incrassatis.

Long. 5 lin. ♂.

Brazil. Received from Paris under the name of *Oregostoma atratum*, Dej. The globose-conical anterior coxæ bring it within Lacordaire's definition of the genus *Ommata*. The antennæ are thick, scarcely enlarged towards the apex, and about three-fourths the length of the body.

Ommata asperiventris, n. sp.—Obscure cyanea, subtus creberrime rugoso-punctulata; capite grosse punctato; thorace supra nigro, æneo-tincto, crebre reticulato-punctato, brevi, lateribus regulariter rotundatis; elytris vix nitidis, creberrime aspere punctatis; femoribus posticis elytris multo brevioribus, apice distincte clavatis.

Long. 5 lin. ♂.

Rio Janeiro, Constancia (Rev. H. Clark). The antennæ are nearly as long as the body, and thickened towards the tip.

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Charis Corinna (*Odontocera id.*, Pascoe, Trans. Ent. Soc. 3rd ser. V. p. 290).

Originally found near Sta Martha, New Granada. One example, Chontales.

Genus TETHLIMMENA, nov. gen.

Sub-fam. *Eroschemina* pertinet. Facies *Pteroplati*. Corpus maxime depressum, postice gradatim dilatatum. Caput longe exsertum, antice brevissimum, pone oculos elongatum, gradatim angustatum. Oculi magni, late emarginati. Tuberes antennifera paulo elevata. Antennæ (♀) corpore paulo breviores, articulis 3-10 valde dilatatis, compressis, triangularibus, supra oblique setosis nec ciliatis. Thorax trapezoideus, lateribus bisinuatis vel trituberosis. Elytra plana, absque carinis, apice breviter ciliata. Pedes haud robusti; femora subito clavata; tarsi breves. Acetabula antica extus angulatim elongata, coxis magnis, valde exsertis; mesosternum inter coxas latissimum, planum, acetabulis extus apertis. Abdomen (♀) ut in Gen. *Obrium;* segmento 2ndo ventrali arcuato, ciliato, sequentibus concavis.

The strange little creature forming this genus, is the only Tropical American form yet known allied to *Eroschema, Chaodalis* and *Pyrocalymma;* genera belonging to Australia and India. It approaches very near to *Pyrocalymma* in the form of the anterior haunches, and their sockets.

Tethlimmena aliena, n. sp.—Caput thorax et elytra fulva, his triente apicali et capitis lateribus nigris; antennis pedibus corporeque subtus nigris, sternis et coxis testaceis; elytris planissimis, crebre æqualiter punctatis, opacis.

Long. 4½ lin.

One example.

Callichroma holochlorum, n. sp.—*C. plicato* (Leconte) statura simile; magnum robustum, viridi-æneum, elytris saturate viridibus, sericeis, pedibus nigris, femoribus anticis et intermediis (apice exceptis), posticorumque dimidio basali, rufis; tibiis posticis paulo flexuosis, a basi gradatim et late dilatato-compressis; tuberis antenniferis obtusis; antennis nigris, ♂ corpore plusquam duplo

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longioribus; thorace subnitido, disco indistincte transversim ruguloso; corpore subtus vix tomentoso.

Long. 16-18 lin. ♂ ♀.

Sent in large numbers from Chontales. By some entomologists it has been considered the *Cer. virens* of Linnæus; but this is impossible, as Linnæus in Mus. Lud. Ulr., distinctly says the hind femora are toothed, and his insect is therefore a West African *Callichroma*.

Callichroma cosmicum, White, Cat. Long. Col. Brit. Mus. p. 158.—Also common in collections from Chontales. This species is found also in New Granada.

Callichroma cyanomelas, White, Cat. Long. Col. Brit. Mus. p. 164.—Apparently common in Chontales. Also Guatemala. It is liable to be confounded with the Mexican *C. melancholicum*.*

Callichroma columbinum, Guér. Revue Zoologique, 1838, p. 282.—Found also in Cuba.

Coremia hirtipes, Oliv. Entom. IV. 68, p. 14, pl. 1, f. 8.—This common South American species is met with of large size in Chontales.

Cyllene guttatus, Chevrolat, Ann. Soc. Ent. Fr. 1860, p. 459.—Apparently common in Chontales; also Mexico.

Cyllene Cayennensis, Laporte and Gory, Monogr. Clytr. p. 10, pl. 3, f. 9.—The Chontales form has precisely the same markings as the Cayenne species.

Neoclytus Ion, Chevrolat, Ann. S. E. F., 1860, p. 496, pl. 9, f. 9.—Differs from the Mexican form by the presence of a short yellow streak on the shoulders of the elytra. Having only one example before me, it cannot be decided whether the character is constant, and of specific importance.

Neoclytus Lebasii, Chevrolat, Ann. S. E. F., 1861, p. 381.—One example. Although agreeing pretty well

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* This species has never been described:—*Callichroma melancholicum* (Chevr., MSS.).—Statura *C. cyanomelanos* sed toto nigro-velutino, opaco; tuberibus antenniferis obtusissimis, subtiliter crebre punctulatis; tibiis posticis a basi compresso-dilatatis flexuosis; femoribus aterrimis, nitidis.

Long. 15 lin.

Mexico.

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with Chevrolat's description, I am not sure of the identity of his species with that from Chontales; the third fascia of the elytra being straight, and not curved to the suture, as in the true *Labasii*.

Neoclytus Æsopus, Chevrolat, Ann. Soc. Ent. Fr. 1860, p. 502, pl. 9, f. 12.—The describer of this species placed it in the genus *Tillomorpha*.

Neoclytus rufus, Oliv. Entom. IV. 70, p. 28, pl. 7, f. 81. —Chontales specimens agree exactly with those from Venezuela.

Mecometopus macilentus, n. sp.—*M. festivo* colore similis, differt corpore angustissimo, lineari, thorace globoso-ovato, elytris multo latiori; nigerrimus opacus, elytris utrinque macula brevi transverso prope basin, 2nda proxime assequenti suturali, triangulari, communi, 3iaque parva laterali ante medium, et, longe ante apicem, fascia angusta, læte flavis; apice oblique truncatis, extus spinosis; corpore subtus nigro, pectore et abdominis segmentis 2 basalibus macula laterali triangulari, flava; antennis fuscis, 9-articulatis; articulo 5-9 incrassatis, basi angustatis; capite antice verticali, sed brevi et lato ut in *Neoclyto*.

Long. 4 lin.

Chontales, one example. The antennæ, although evidently quite perfect in the specimen, have only nine joints, all distinct from each other, without trace of consolidation.

Mecometopus Jansoni, Bates, Trans. Ent. Soc. 1870, p. 399.

Diphyrama, nov. gen.

Sub-fam. *Tillomorphinæ:* Gen. *Ipomoriæ* et *Epropeti* affinis, differt antennis utroque sexu articulis 3 et 4 apice valde ovato-clavatis. Corpus lineare, supra subplanum, elytris ante apicem paulo declivibus; sericeo-tomentosum et passim erecte setosum. Caput exsertum, collo crasso, fronte brevi obliqua, tuberis antenniferis planis, vertice lato, plano; oculis valde emarginatis et distantibus. Palpi articulis terminalibus dilatatis, oblique truncatis. Antennæ ♂ corpore sesqui longiores, haud spinosis, nec carinatis, utroque sexu articulis 3 et 4 apice

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abrupte clavatis, 5-11 linearibus, haud decrescentibus. Thorax dimidium elytrorum æquans, cyathiformis, antice ovato-convexus, ante basin valde constrictus, ante apicem autem paulo constrictus. Elytra planata, apice rotundato. Femora crassa, gradatim clavata: tarsi articulo primo elongato, cæteris æqualibus. Pro- et mesosterna inter coxas angustissima; acetabula extus clausa.

Diphyrama singularis, n. sp.—Olivaceo-nigra, subtus et pedibus (interdum autem antennis) castaneo-fuscis, tomento sericeo, griseo-argenteo, vestita; elytris fascia angusta basali a humero ad humerum arcuata, alteraque multo latiori pone medium, per suturam ascendenti, sericeo-nigra.

Long. 3½-6 lin. ♂ ♀.

Chontales; many examples. A curious and pretty Longicorn, closely allied to *Epropetes latifascia*, differing by its long antennæ with strongly clavate third and fourth joints, by its thorax more abruptly constricted near the base, and by the markings of the elytra.

Listroptera aterrima, Germar, Ins. sp. nov. p. 497.—A species of wide distribution from South Brazil to Nicaragua.

Dihammophora Chontalensis, n. sp.—Sublinearis, nigra, opaca, thorace cylindrico, paulo inæquali, aurantiaco, opaco; elytris squamulis griseis minutis dense vestitis, punctos fere obtegentibus, disco extus lineis duabus elevatis.

Long. 4 lin. ♂.

Very similar to *D. nitidicollis*, but distinguished by the absence of silky gloss on the thorax, and by the elytra being clothed with minute griseous scales, which nearly conceal the punctures; the two exterior raised lines are black. The antennæ are rather longer than usual in this genus, reaching at least to three-fourths the length of the body.

One example.

Rhopalophora versicolor, Chevrolat, Thoms. Arc. Nat. p. 62.—Also found in New Granada.

Rhopalophora serripes, n. sp.—*R. pustulosæ* affinis, differt thorace breviori et latiori, medio magis dilatato,

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antice et postice magis constricto, capite nigro etc. Subtus et femora chalybea, capite olivaceo-nigro, scabroso, opaco: antennis articulo basali apice inflato-clavato; thorace scabroso, læte rufo, vitta dorsali, antice angustato, nigro; elytris olivaceo-nigris, minutissime scabrosis et punctis majoribus passim adspersis; femoribus basi supra asperatis, tibiis posticis extus fortiter denticulatis; prothorace subtus rufo, sterno medio fusco.

Long. 6½ lin. ♀.

One example.

Cosmisoma Titania, Bates, Trans. Ent. Soc. 1870, p. 407.—Mr. Belt has sent home a large number of specimens of this exquisite species, all conformable to the description above quoted. The size varies from 4½ to 6½ lines.

Cosmisoma martyra; (*C. martyr*, Thomson, Classif. des Ceramb. p. 180).—Thomson describes the elytra as having "fasciis duabus albescentibus." I presume this means that the vittæ are of a lighter green than the general colour; in which case, his description suits the Chontales insect perfectly. The species much resembles *Closteropus*, and has the middle acetabula a little open externally: the fifth antennal joint is, however, tufted with black hairs. Described originally from Costa Rica.

Ozodes multituberculatus, Bates, Trans. Ent. Soc. 1870, p. 409.—Mr. Belt has sent many examples, offering no noteworthy variation.

Ozodes xanthophasma, n. sp.—Angustior, flavo-testaceus, capite thoraceque aureo-sericeo tomentosis; thorace postice paulo angustato et fortiter constricto, disco antico utrinque tubere oblique elevato, postice in carina elevata continuato, carinis et linea dorsali nigris; elytris, ante medium, fasciis duabus valde flexuosis, et apice late, pallidoribus, spatiis inter has paullo infuscatis; femoribus abrupte valde clavatis, clavis basi indistincte fusco annulatis.

Long. 5-10 lin. ♂ ♀.

Many examples. Distinguished from the similarly coloured *O. malthinoides* by the abruptly clavate femora, &c.

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Ornithia Chevrolatii, Guér. Icon. R. A. texte, p. 228. —Many examples, offering no difference from those from Mexico.

Chrysoprasis Beltii, n. sp.—Elongata, robusta, lætissime viridi-ænea, abdomine rufo; capite supra rugoso-punctato; antennis corpore plusquam duplo longioribus, parce ciliatis, nigris, articulo basali æneo; 3-7 apice longe spinosis; thorace elongato, latitudine nec breviori, medio parum rotundato, supra utrinque transversim haud profunde ruguloso, disco utrinque velutino; elytris apice recte truncatis, angulo exteriori dentato, supra brevissime setosis, subtiliter punctatis, versus suturam subvelutinis, juxta latera aureo-tinctis; prosterno transversim dense rugoso-punctato; metasterno splendide aureo, fere lævi; pedibus fortibus et valde elongatis, æneis.

Long. 8½ lin. ♂.

Esquipula, Nicaragua. The handsomest species of the genus.

Chrysoprasis sobrina, Bates, Trans. Ent. Soc. 1870.—One example, ♀. Differs from types of *sobrina* in the more finely punctured thorax and elytra, and may prove to be distinct on the comparison of a series of specimens.

Chrysoprasis hirtula, White, Cat. Long. Col. Brit. Mus. p. 150.—Found also in Venezuela.*

Stenosphenus ochraceus, n. sp.—Robustus, elongato-ellipticus, rufo-fulvus, ochreo-pubescens; capite subnudo, grosse sparsim punctato; thorace a basi ad apicem rotundato-attenuato, medio nudo, nitido, punctulato, lateribus nigro-vittatis; elytris apice truncatis et bispinosis, supra lineis tribus nudis, paulo elevatis, exterioribus duabus, et interiori basi, nigris; antennis (articulis 2 basalibus exceptis) nigris, articulis 3-8 apice spinosis.

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* Add:—*Chrysoprasis atrata*, n. sp.—Nigra, elytris sericeis, capite et thorace opacis, antennis et pedibus nitidis; abdomine rufo; capite et thorace creberrime nec grosse punctatis, hoc antice angustato, ante basin paulo dilatato, basi ipso angustato; elytris apice recte truncatis, extus dentatis, supra modice punctatis et nigro-setosis; prosterno ruguloso-punctatis; metasterno crebre sed discrete punctulato; antennis ♂ corpore paulo longioribus, ♀ brevioribus, haud armatis.

Long. 5 lin. ♂ ♀.

Merida, Venezuela (Göring).

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Long. 7-8 lin. ♂ ♀.

Taken by Mr. Belt in considerable numbers. The largest and broadest species of the genus, and also the most southerly in range, the other species being inhabitants of Mexico, and the Atlantic States of N. America. It approaches, in shape of thorax and pubescence, nearest to *hirsutipennis* (Chevr.)* a much smaller and slenderer insect.

Ancylocera rugicollis, Fabr. Syst. El. II. 317.—The elytra in the Chontales specimens seem relatively a little

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* This species has never been described:—*Stenosphenus hirsutipennis*, (Chevrolat, MSS.) n. sp.—Anguste ellipticus, niger, cano-pubescens, capite et thorace castaneo-rufis, nitidis, nudis, illo grosse scabroso, hoc sparsissime punctulato, basi constricto, deinde subito rotundato, dilatato, apicem versus attenuato; elytris recte truncatis, angulo exteriori spinoso, interiori denticulato, supra vittis quatuor cano-pubescentibus, interstitiis nudis, paulo elevatis; corpore subtus lateribus grosse punctato; antennis nigris cano-pilosis.

Long. 5½ lin.

Mexico.

Add:—*Stenosphenus trispinosis*, n. sp.—*St. cribripenni* (Thoms.) proxime affinis, differt thorace sparsim tenuiter punctulato, elytrisque dorso striato-punctatis, apice utrinque trispinosis. Niger, femoribus rufis; thorace angusto, elongato, apicem versus angustato, postice parallelo, supra sparsissime punctulato; elytris apice utrinque trispinosis, supra prope suturam carina lata elevata, dorso striato-punctatis, lateraliter confuse punctatis.

Long. 6½ lin.

Mexico. Received from Paris as *St. striatopunctatis* (MSS.). The name here adopted expresses the remarkable peculiarity of the three-spined apex.

Stenosphenus rufipes, n. sp.—Brevior, niger, antennis et pedibus rufis; capite grosse sparsim punctato; antennis articulo primo grosse punctato, 3-11 cano-tomentosis; thorace elongato, a basi ad apicem angustato, angulis posticis prominulis, supra plagiatim punctulato; elytris (cum abdomine) brevibus, apice oblique sinuato-truncatis, angulo exteriori producto, acuto, interiori leviter spinoso, supra passim punctulatis, fulvo-pilosis; femoribus grosse punctatis.

Long. 6 lin. ♀.

Tehuantepec, Pacific side (A. Boucard).

Stenosphenus suturalis, n. sp.—Niger, elytris coccineis, sutura late nigra; thorace breviori, ut in *St. amabili*, sed antice magis angustato, basi constricto, deinde dilatato-rotundato, supra sparsissime punctato; elytris apice recte truncatis, angulis spinosis, supra punctulatis et leviter fulvo-setosis; femoribus et pectore punctulatis.

Long. 5½ lin.

Mexico (A. Boucard).

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shorter than in others from Texas, with which I have compared them. The species has therefore a wide range from S. Carolina to Nicaragua.

Stenygra histrio, Serville, Ann. Soc. Ent Fr. 1834, p. 97.—A well-known Mexican insect.

Cœlarthron quadrinotatum, Bates, Trans. Ent. Soc. 1869, p. 385.—Mr. Belt has sent a good series of this distinct species; the specimens do not offer any noteworthy difference.

Evander nobilis, n. sp.—*E. Nietii* (Guér.) similis, differt inter alia elytris basi haud maculatis; capite ochraceo, vertice nigro, grosse scabroso-punctato; thorace ochraceo, dorso vittis tribus angustis, nigris, mediana antice abbreviata; supra omnino scabroso-punctato, antice lato, quadrato, pone spinam sinuato-angustato; scutello triangulari-elongato, ochraceo, vitta lata nigra; elytris ante apicem paulo rotundato-dilatatis, margine apicali ciliato; supra 4-costatis, costa 1ma brevi, reliquis apice abbreviatis, 4ta flexuosa, interstitiis crebre punctulatis, ochraceis, triente apicali violaceo-nigris; corpore subtus sericeo-nigro, prosterno et mesosterno medio ochraceis, inter coxas valde elevatis; pedibus nigris, femoribus anticis annulo fulvo; antennis nigris, articulis apice dilatatis, ultimo appendice angusto acuto.

Long. 10-12 lin. ♂ ♀.

Chontales. The scutellum is rather broader at the base than in *E. xanthomelas*. The antennæ are similarly formed, except the narrow sharp appendix to the terminal joint, which is similar in both sexes.

Pteroplatus sellatus, White, Cat. Long. Col. Brit. Mus. p. 82, pl. 3, f. 3.—Also found in Mexico.

Crioprosopus rutilans, Bates, Trans. Ent. Soc. 1869, p. 384.—Mr. Belt has taken several examples of this splendid species, the elytra of which have an indescribable polish, and are furnished, before the apex, with a sharp dentiform projection on each side.

Genus Metaleptus, nov. gen.

Gen. *Purpuricenus* proxime affinis, differt tarsis posticis elongatis tenuibus, antennisque maris tenuioribus. Tu-

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bores antennifera haud elevata, apice nec acuminata. Antennæ ♂ corpore duplo longiores, tenues, apicem versus tenuissimæ, articulo 11mo precedenti duplo longiori, appendiculato; ♀ corpore haud longiores. Thorax transversus, rhomboideus. Scutellum late triangulare. Pedes elongati, tarsis posticis articulo basali reliquis longitudine æqualibus. Mesosternum obliquum, aliquando leviter tumidum.

This distinct group, having the facies and colouration of *Purpuricenus*, was indicated by Lacordaire (Genera Col. vol. ix. p. 178, note) and seems confined to the northern part of Tropical America.

Metaleptus marginellus, n. sp.—Niger, opacus, brevissime sericeo-pubescens, marginibus elytrorum sanguineis, margine suturali (basi excepto) angustissime, basali et laterali latioribus; thorace lateribus medio angulatim dilatatis nec spinosis, supra crebre punctulato; elytris creberrime sub-rugulose punctulatis, opacis, apice subtruncatis; corpore subtus dense cano-pubescente.

Long. 5½-9½ lin. ♂ ♀.

Chontales. Also found in Mexico, The sexes are not differently coloured. In one example from Chontales the bright red margin is wider than usual, at the base especially being of great width.

Metaleptus coccinatus, n. sp.—Niger, opacus, subtus dense cano-pubescens, elytris læte coccineis; thorace crebre punctulato, lateribus medio fortiter acute tuberculato; scutello nigro, medio rufo; elytris apice singulatim rotundatis, supra discrete haud dense punctulatis; antennis (♀) corpore multo brevioribus.

Long. 8½ lin. ♀.

One example only of this very distinct and handsome species, in Mr. Belt's collection.*

Eriphus prolixus, n. sp.—Maxime elongatus, cylindricus, flavo-testaceus, capite antennis pedibusque nigris, elytris

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* Add:—*Metaleptus binoculus*, n. sp.—Niger, opacus, subtus dense cano-pubescens, elytris coccineis, utrinque pone medium macula discoidali, oblongo-ovata, nigra; thorace crebre punctato, linea dorsali lævi: scutello nigro; elytris apice obtuse rotundatis, angulis exterioribus breviter dentatis, supra subsparsim punctulatis; antennis (♀) corpore paulo brevioribus.

Mexico.

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fusco-nigris, macula magna communi pone scutellum (postice ad suturam incisa), alteraque minori sub humero, fulvo-testaceis; thorace lateribus medio breviter tuberculato, supra convexo, inæquali, impunctato, cum elytris sparse nigro-setosis; scutello nigro; elytris breviter oblique truncatis, supra punctulatis: pedibus posticis valde elongatis, femoribus apice haud armatis.

Long. 8 lin.

One example, ticketed as taken at "Esquipula."

Genus Pleuromenus, nov. gen.

Sub-fam. *Stenaspidinæ* pertinet; Gen. *Entomosternæ* quodammodo similis, sed tarsis posticis brevibus, latis, sternisque inter coxas valde elevatis. Caput et palpi *Purpuriceni*. Antennæ ♂ corpore plusquam duplo longiores, ♀ breviores, robustæ, subserratæ. Thorax rhomboideus, lateribus medio obtuse tuberosus, margine postico bisinuato. Scutellum valde elongatum, angustum. Elytra parallela, depressa, apice haud declivia, supra utrinque fortiter quadricostata. Femora linearia, robusta; tarsi postici articulo primo 2ndo et 3io conjunctis breviori. Mesosternum inter coxas valde elevatum, antice verticale, postice processu metasternali continuatum, sutura separatum.

The characters of this genus offer a combination of those of *Stenaspis* and *Entomosterna*, having the long scutellum and short posterior tarsi of the former, and the general style of coloration and ribbed elytra of the latter. In one of the species, the metasternum advances far between the middle coxæ, reducing the mesosternum to a small vertical piece; in the other, it advances no further than is seen in the genus *Sphenothecus*.

Pleuromenus baccifer, n. sp.—Parallelopipedus, chalybeo-niger; capite velutino, tuberculis antenniferis acuminatis, approximatis; thorace utrinque tuberibus quinque lateralibus læte coccineis, nitidis, dorso nigro-velutino, medio tuberculo unico valde elevato; scutello valde elongato, lateribus rectis, nigro-velutino, medio sulcato; elytris apice conjunctim late rotundatis, supra depressis, nigro-tomentosis, utrinque costis quatuor subnitidis; corpore subtus et pedibus chalybeis: prosterno ultra coxas producto et elevato; mesosterno brevissimo, antice verticali; metasterno convexo, medio antice producto.

Long. 6-7½ lin. ♂ ♀.

Several examples, chiefly ♀, taken by Mr. Belt.

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Pleuromenus semicostatus, n. sp. — Parallelopipedus, niger nitidus; capite grosse punctato, tuberibus antenniferis vix elevatis nec acuminatis; thorace rhomboideo, supra sparsim punctato, utrinque plaga magna laterali intus curvata sanguinea, tubere magno elongato obliquo tegenti; scutello valde elongato, lævi lateribus incurvatis; elytris apice late angulatim rotundatis extus breviter dentatis, supra prope basin glabris et sparsim punctatis, deinde nigro-tomentosis opacis costis quatuor lævibus, utrinque flavo bifasciatus, prima ante secunda longe post medium, fasciis glabris; prosterno inter coxas convexo; mesosterno valde elevato antice verticali.

Long. 8 lin. ♂.

This handsome species was sent to me by Mr. T. Reakirt of Philadelphia, as coming from Nicaragua. Although differing from *P. baccifer* in several points of structure, the many important features of resemblance evidently show a generic relationship.

Trachyderes elegans, Dupont, Mag. Zool. pl. 154, f. 1. —Chontales specimens are darker in colour than those of Mexico, and the yellow rings of the antennæ are often absent from the fourth and fifth joints.

Trachyderes interruptus, Dupont, Mag. Zool. pl. 158, f. 2.—Found also in New Granada.

Megaderus latifasciatus, Bates, Trans. Ent. Soc. 1870. p. 438.—Chontales.

Section. C.

Antennæ inserted close to the base of the mandibles. Eyes coarsely facetted.

Distenia Pilatei, Chevrolat, Rev. & Mag. Zool. 1857, No. 3, pl. 6, f. 2.—Originally found at Teapa and Cordova, Mexico. Mr. Belt has taken many examples in Chontales. The *D. fimbriata* described by Lacordaire (Genera, ix. p. 228, note) from an unknown locality, must closely resemble this fine species.

Distenia geniculata, n. sp.—*D. undatæ* affinis, fusconigra nitida, sparsim pubescens haud tomentosa sicut *D. undata*, antennis et pedibus rufis, geniculis (haud armatis) nigris; palpis nigris articulo terminali obtuse acuminato;

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thorace dorso tricalloso interstitiis scabrosis; elytris apice utrinque bispinosis, dimidio basali crebre grosse lineatim punctatis, dimidio apicali lævi, utrinque fasciis indistinctis flexuosis duabus cano-tomentosis, una apud medium altera longe post medium.

Long. 8-10 lin. ♀.

Two examples sent by Mr. Belt.

Distenia chrysostigma, n. sp.—Parva, nigra nitida, sparsim griseo pubescens: thorace medio dorsi plaga tomentosa aurea, ibique plano, disco lateraliter nitido sparsim scabroso; elytris angustis, apice breviter bispinosis, dorso (apice excepto) grosse lineatim punctato, utrinque vittas duabus argenteo-tomentosis, una suturali per apicem continuata, altera discoidali apice abbreviata; antennis nigris, pedibus nigris nitidis, femoribus (versus apicem exceptis) et tibiis (basi et apice exceptis) testaceo-flavis.

Long. 5½ lin. ♂.

One example, in Mr. Belt's collection.

Distenia fastuosa, Pascoe, Ann. & Mag. Nat. Hist. Oct. 1871, p. 274.—Distinguished from *D. rufipes* (which has a similar bright green colour, and red legs) by the coarse lineate-punctate base, and smooth apex, of the elytra; *D. rufipes* being more uniformly punctulate.

Distenia rufipes, Bates, Trans. Ent. Soc. 1870, p. 440. —Found also at Sta Marvha, New Granada; the Chontales specimens are much larger than the one I have from the former locality, and may prove distinct.

Cometes pulcherrimus, n. sp.—*C. hirticornis* paulo angustior, læte viridi-cyaneus nitidus, elytris sutura et lateribus purpureis, fasciis duabus aurantiacis, prima basali ad sutura postice late interrupta, altera post medium integra, apice acute conjunctim rotundatis, supra omnino (basi sublineatim) crebre punctatis; antennis, basi excepto, nigris.

Long. 4½-5 lin.

A few examples only of this exquisite species were taken by Mr. Belt.

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Fam. LAMIIDÆ.

Ptychodes trilineatus, Lin. Mant. 532.—Chontales specimens do not differ from those of Mexico and Venezuela.

Ptychodes cretatus.—Fuscus, tomento fusco-griseo vestitus; fronte inter antennas ut in *Pt. trilineato* angulatim concava; elytris apice juxta suturam oblique truncatis et procul a sutura oblique unispinosis, supra albo-irroratis, macula majori medio-basali, plagisque tribus magnis lateralibus, cretaceo-albis; capite et thorace vitta lata laterali cretacea; metasterno et segmentis ventralibus utrinque albo-unimaculatis; mesosterno breviter tuberculato.

Long. 1 in.-1 in. 2 lin. ♂ ♀.

Several examples of this very distinct species have been sent home by Mr. Belt.

Ptychodes Lecontei, Thomson, Rev. & Mag. Zool. 1856, p. 477, pl. 24, f. 1.—Apparently a common insect in Chontales. Originally described from Costa Rica.*

Tæniotes scalaris, Fab. Ent. Syst. I. 2, p. 257; (*T. suturalis*, Thoms. Archiv. Ent. I. 172).—The Fabrician description accords with the Mexican and Central American form of this insect, which Thomson has redescribed as *T. suturalis*. The only difference from the South American local form, is in the amount of spotting on the elytra; *T. scalaris* having the fewest spots, as indicated in the Fabrician diagnosis, "Elytra fusca, puncto medio suturaque dentata albis."

Tæniotes præclarus, n. sp.—*T. inquinato* similis; differt colore nigro nec metallico, capite thorace et pectore lateraliter late flavo-vittatis, elytrisque apice nullo modo armatis. *T. inquinato* paulo robustior et minus elongatus, niger, pube griseo-fusca tenuiter vestitus, linea angusta

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* Add:—*Ptychodes niveisparsis*, n. sp.—Niger nitidus, elytris omnino albo irroratis, apice prope suturam breviter sinuato-truncatis, angulo suturali spinoso, exteriori dentato; capite et thorace dorso lineis duabus approximatis albis; genis transversim albo-lineatis, et corpore toto ab oculis usque ad anum late albo-vittata; mesosterno tuberculo magno, antice producto.

Long. 11 lin.

Panamà.

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flava a vertice usque ad apicem suturæ elytrorum extensa, in elytris dentata, his quoque flavo bifasciatis fasciis macularibus interruptis, una ante altera longe post medium, lateribus flavo conspersis et puncto flavo discoidali prope basin; capite et thorace dorso scabrosis, elytris basi tantum granulosis deinde punctulata apicem versus lævissimis; subtus capite thorace et mesosterno lateribus flavo late vittatis; metasterno et ventre flavo-maculatis.

Long. 1 in. 2 lin.-1 in. 5 lin. ♂ ♀.

One example (♀) in Mr. Belt's collection, and one ♂ in my own, from Mr. Chesterton's collection, N. Granada.

Tæniotes Luciani, Thoms. Classif. Ceramb. p. 101; (*T. Buquetii*, Thoms. Ann. Soc. Ent. Fr. 1856, p. 329, pl. 8, f. 1).—Apparently common in Chontales.*

Deliathis nivea, Bates, Trans. Ent. Soc. 1869, p. 388.—Mr. Belt has now sent the ♂ of this beautiful species. It does not differ, except in its more slender form, and slightly longer antennæ, from the ♀ described *loc. cit.*

Hammoderus spinipennis, Thoms. Classif. Ceramb. p. 100 (1860); (*T. thoracicus*, White, Ann. & Mag. Nat. Hist. 1858, p. 266 ?).—Many examples from Chontales.

Hammoderus inermis, Thomson, Arch. Ent. I. 173 (1857) Classif. Ceramb. p. 99; (*Tæniotes albiplagiatus*,

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* The following are also new:—

Tæniotes Buckleyi, n. sp.—Quoad colores medium tenet inter *T. Orbignyi* et *T. Luciani*. Niger pube sericea tenui purpureo-fusca vestitus: linea angusta flava a fronte usque ad scutellum ducta, elytris maculis parvissimis flavis sparsis quarum quatuor paulo majoribus ut in *T. Luciani* sitis; linea transversa flava sub oculos, vittaque paulo latiori laterali paulo interrupta ab oculis usque ad anum extensa.

Long. 1 in. 2 lin.

Gualaquiza, Equador (Buckley). Some of the yellow dots of the elytra are arranged in an oblique line near the apex, similarly to the larger spots of *T. Orbignyi*.

Tæniotes nævius, n. sp.—*T. farinoso* affinis, angustior magis elongatus elytris pauciter maculatis et in ♂ sutura ad apicem recta spinosa. Niger pube tenui grisea vestitus; capite vertice linea pallide flava, lateribus lineis tantum duabus una supra altera infra oculum; thorace lineis angustis tribus ut in *T. farinoso;* elytris ♂ apice ad suturam haud dehiscentibus ibique longe dentatis vel spinosis, ♀ paulo hiantibus et breviter spinosis, supra maculis parvis flavis pauciter conspersis quarum 4 vel 5 disci paulo majoribus; subtus pectore et ventre lateraliter flavo maculatis; antennis ♂ ris quam in *T. farinoso* multo minus elongatis.

Long. 8-12 lin. ♂ ♀.

Gualaquiza, Equador (Buckley).

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White, Ann. & Mag. N. H. 1858, p. 266).—One example, found at *S. Gertrudes*, in Mr. Belt's collection.

Hammoderus elatus, n. sp.—*H. spinipenni* major, robustior, magis elongatus; elytris eodem modo apice spinosis sed maculis vel plagis utrinque quatuor cretaceis subæqualibus (prima medio basi, 2nda laterali ante medium, 3a discoidali longe post medium, 4a paulo ante apicem) disco et margine maculis parvis nonnullis, quarum una majori sub humero. Fuscus, pube dense ochreo-fusco vestitus, oculis infra flavo-marginatis: thorace tuberculis pube densa obtectis, antice sulco flexuoso, postice sulcis rectis notato, utrinque ante spinam macula alba; elytris basi granulatis, ultra medium sublævibus; metasterno, ventrisque segmentis (sæpe) utrinque macula parva cretacea.

Long. 1 in. 1 lin.-1 in. 4 lin. ♂ ♀.

Many examples.

Hammoderus rubefactus, n. sp.—Fuscus, fusco-ochraceo tomentosus, elytris apice utrinque fortiter spinosis, supra maculis parvis et plagis majoribus difformibus quinque rufo-ochraceis ornatis, prima basali, 2-4 discoidalibus, 5ta majori apicali; corpore subtus haud distincte maculato.

Long. 1 in. 5 lin. ♀.

One example, in Mr. Belt's collection.

Tapeina transversifrons, Thomson, Archiv. Entom. I. 44.—Also found in Mexico.

Tautoclines griseicauda, n. sp.—Subcylindrica, ante apicem leviter rotundato-dilatata, fusca, pube ochreo-fusca vestita; thorace supra grossissime subconfluenter punctato; elytris grosse lineatim punctatis, apice acute singulatim rotundatis, maculaque magna apicali grisea ochraceo et fusco variegata.

Long. 2¾ lin.

Two examples.

Adetus costicollis, n. sp.—Elongatus, cylindricus, fusco-niger, pube fusca (in capite thorace et pedibus rufo-fusca) vestitus; capite grosse discrete punctato: thorace antice angustato, dorso inæquali, costis indistinctis longitudinalibus, grossissime confluenter punctato;

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elytris lateribus inæqualibus, apice rotundatis, dorso lineatim modice, lateribus grosse flexuose irregulariter, rugoso-punctatis: apice macula pallide rufo-fusca antice linea curvata albescenti marginata, mesosterno inter coxas convexo canaliculato.

Long. 6 lin.

Two examples; Chontales.

Adetus validus; (*Parmenonta valida*, Thoms. Physis. II. p. 158).—Also Mexico.

Esthlogena porosa, n. sp.—*E. comatæ* similis, differt, inter alia, corpore supra toto punctis magnis vel foveolis consperso. Elongata, pilosa, supra pube ochreo-fusca vestita, infra cum pedibus et antennis nigra, cano-tomentosa, his articulis 3-11 basi albis; thorace dorso haud tuberculato; elytris apice recte obtuse truncatis.

Long. 6-7 lin.

Several examples.

Estola perforata, n. sp.—*Esthlogenæ porosæ* similis, sed brevior et unguiculis ut in Gen. *Estola* divaricatis. Fusca, tomento ochreo-fusco vestita, fronte, thorace et elytris punctis magnis conspersis, in elytris lineatim ordinatis, his apice rotundatis; thorace dorso haud tuberculato; antennis nigris, articulis 4-11 basi griseis; corpore subtus pedibusque dense cano-tomentosis.

Long. 4½-5½ lin. ♂ ♀.

Also found in Venezuela.

Estola ignobilis, n. sp.—*E. lineolatæ* proxime affinis, differt thorace basi haud lineolata; forma corporis eadem, thorace grosse haud dense punctato, dorso subtuberculato; elytris apice obtusissime breviter truncatis, supra punctato-striatis, ochraceo-fusco pubescentibus, minus quam in *E. lineolata* nigro et griseo variegatis; antennis et pedibus rufo-piceis, griseo-variegatis, articulis 4-11 basi griseis, 8vo griseo apice fusco sed minus claro quam in *E. lineolata*; ab *E. varicornis* differt thorace haud dense punctato.

Long. 4½ lin.

Two examples.

Desmiphora Mexicana, Thomson, Classif. des Ceramb. p. 75.—Found also in Mexico.

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Desmiphora cirrosa, Erichson, Consp. Col. Peruana, p. 147.—Also found in Eastern Peru, and throughout the Amazons region.

Epectasis attenuata, Bates, Ann. & Mag. Nat. Hist. 1866, April.—A widely-distributed species. I have compared specimens from Rio Janeiro, the Amazons, and Chontales, and find no material difference. Fresh examples show a narrow grayish line down the suture.

Ærenea impetiginosa, Thoms. Physis. II. p. 95.—Also found in New Granada.

Jamesia papulenta, Thoms. Physis, II. p. 43.—Also found in New Granada.

Jamesia multivittata, Bates, Trans. Ent. Soc. 1869, p. 388.—Mr. Belt has sent home several examples of this well-marked species.*

Tybalmia cæca, n. sp.—*T. pupillata* magis elongata; elytris quarta parte basali dense tuberculata, macula nigra discoidali haud pupillata, angulata, difformi.

Long. 13 lin. ♂.

One example.†

Hypsioma picticornis, Bates, Ann. & Mag. Nat. Hist. Sept. 1865.—Also found in the Amazons region.

Ischiocentra heraldica, n. sp.—Oblonga, robusta, lata, tomento ochreo-fusca vestita, griseo obscure varia, elytris medio fascia lata obliqua carneo-ochracea; capite cornubus frontalibus brevibus crassis, vertice ochreo-quadrivittato; thorace tuberculo laterali distincto acuto; elytris passim modice punctatis, humeris curvatis paululum

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* *Hypsioma gemmata*, Blanch., Voy. de D'Orb. Ins. pl. 22, f. 7, is a species of this genus, very closely allied to *J. globifera*, F.

† Add:—*Tybalmia tetrops*, n. sp.—*T. pupillata* magis elongata, elytris utrinque maculis duabus discoidalibus transversim positis, antice vage cinereo-marginatis. Elongato-oblonga, modice convexa, ochreo-fusca; vertice vittis quatuor nigro-fuscis: elytris oblongis, postice paulo angustatis, supra triente basali dense haud profunde punctatis, granulis perpaucis commixis.

Long. 13 lin. ♀.

Pebas, Upper Amazons (Hauxwell.) near *T. mydas*, Lucas, Voy. de Castelnau, Ins. pl. 13, f. 2.

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falcatis, apice nigro-tuberculatis, antennis articulo basali distincte clavato, 3io flexuoso; coxis anticis ♂ris obtuse dentatis.

Long. 9 lin. ♂ ♀.

A distinctly marked species, near *I. liturata*.

Oncideres callidryas, Bates, Ann. & Mag. Nat. Hist. Sept. 1865.—Also found in the Amazons region.

Oncideres fulvostillata, n. sp.—Elongata, valde convexa, robusta, tomento griseo-fusca vestita; elytris prope basin subgibbosis, tuberculis paucis rotundatis nigro-nitidis, deinde nigro-punctatis, pallidioribus, et maculis tomentosis rotundis aurantiacis conspersis; thorace brevi, elytris dimidio angustiori, tuberculo laterali robusto nigro, dorso maculis quinque nigris transversim ordinatis; antennis (♀) corpore longioribus griseis, articulis 1mo et 3io apice nitidis, 4-11 apice late fuscis.

Long. 14 lin.; lat. humer. 5¼ lin. ♀.

A fine species, allied to *O. saga*, Dalm.

Oncideres albomarginata, Thomson, Physis. II. p. 80.—Also found at Cayenne, and in Venezuela.

Eudesmus posticalis, Guérin, Icon. Regne An. p. 248.—Originally described from the interior of Brazil. Found also on the Upper Amazons.

Cylicasta terminata (*Trestonia id.* Buquet, Arc. Nat. p. 47, pl. 5, f. 3; *Trestonia coarctata*, Bates, Ann. & Mag. Nat. Hist. Novem. 1865).—Also found at Cayenne, and in the Amazons region.

Amphicnæia brevivittis, n. sp.—*A. lineatæ* proxime affinis; differt colore nigro, vittaque latâ laterali, ab oculo usque ud dimidium elytrorum extensa, ochracea; thorace linea dorsali nulla.

Long. 2¼ lin.

The elytra have no markings beyond the short lateral vitta.

Hippopsis lineolata, Serville, Encycl. Meth. X. p. 336.—I do not detect any difference between Chontales specimens, and others from Rio de Janeiro.

Chalastinus rubrocinctus, Bates, Trans. Ent. Soc. 1869, p. 385.—Mr. Belt has sent home a large series of this superb species.

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Anisocerus palliatus, White, Cat. Long. Col. Brit. Mus. p. 407; (*A. personatus*, Bates, Trans. Ent. Soc. 1869, 385).

Gymnocerus Beltii.—Ovatus, convexus, robustus, niger nitidus, supra maculis parvis albo-tomentosis irroratus, elytris maculis paulo majoribus, rotundatis, utrinque circiter 15, in fasciis tribus ordinatis; capite inter antennas fere ut in Gen. *Chalastino* angustato, concavo; thorace lato, transverso, tuberculo laterali valido, supra sparsim grosse punctato, dorso subtiliter transversim strigoso; elytris prope basin grosse subcrebre granulosis, deinde punctato-rugosis; corpore subtus pedibusque cinereo-irroratis.

Antennis ♂ris corpore duplo longioribus, 11 articulatis, articulo 11mo precedenti multo longiori; 1mo maxime clavato, 3to et 4to æqualibus, apice subito inflatis sed haud penicillatis.

Long. 8½ lin. lat. 4¼ lin. ♂.

One example, in Mr. Belt's collection.

Polyrhaphis Fabricii, Thomson, Syst. Ceramb. p. 542. —One example only; larger and apparently more richly coloured than the type described by Thomson. Described originally from Cayenne.

Polyrhaphis Paraensis, Bates, Ann. & Mag. Nat. Hist. May, 1862.—Originally described from Pará; found also in Venezuela (Caraccas). It has the general form of *P. papulosa* (Oliv.) but is distinguished at once by the absence of the dense clothing of long hairs which distinguishes *papulosa*, and the long spiniform tubercles of the elytra. From *P. Jansoni* (Pascoe) it is distinguished almost solely by colour, being of an ashy tint above, with blackish-brown clouds on the elytra, and without the lineated appearance of the posterior part, which characterizes the ochreous-tawny clothing of *P. Jansoni*.

Oreodera glauca, Lin. Syst. Nat. II. 626.—A widely distributed insect. Common on the Amazons and in Guiana. Mr. Belt has sent many specimens from Chontales.

Oreodera canotogata, n. sp.—Elongata-ovata, parum convexa, fusca, subtus cinereo pubescens, supra elytris griseo-albis, fascia basali (prope suturam latiori ibique

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obtuse multidentata) macula laterali magna prope apicem intus emarginata, puncto marginali ante medium, alteraque discoidali, fuscis, antennis rufo-fuscis, articulis basi griseis; thorace disco obtuse bituberculato et marginibus grosse pauciter punctato: elytris basi simpliciter sparsim punctatis, humeris curvatis, apice breviter oblique et obtuse truncatis; tibiis apice et tarsis nigris.

Long. 6-7½ lin. ♂ ♀.

Many examples, all conformable to the above description. Allied to *O. cinerea* (Serv.) but shorter and broader, and the brown lateral spot lying much beyond the middle.

Oreodera verrucosa, n. sp.—*O. glaucæ* magnitudine æqualis, magis convexa, elytris ad humeros angustioribus, lateribus haud rectis, &c. Flavescenti-grisea, sericea, elytris utrinque maculis tribus lateralibus fusco-sericeis, 1ma ante medium magna rotundata, 2nda pone medium versus suturam subfasciatim oblique prolongata et undulata, 3ia parva subapicali, omnibus margine fusca connexis; thorace disco antico tnberculis duobus maxime elevatis; elytris prope basin tuberculis paucis angustis elevatis nigris; deinde sparsim punctulatis, apice paulo oblique sinuatim truncatis, utrinque bispinosis.

Long. 10 lin. ♀.

In Mr. Belt's collection.

Oreodera granulifera, n. sp.—Elongato-ovata, parum convexa, fusca, griseo-pubescens, elytris triente basali granulis nigris nitidis et punctis conspersis, griseo-albis, macula parva utrinque medio baseos, alteris duabus difformibus lateralibus, una paulo ante, altera longe post medium, punctoque prope suturam post medium, fuscis, apice oblique truncatis, angulo exteriori producto; thorace dorso antico bituberculato, sparsim punctato; antennis articulis 3-11 rufo-fuscis, basi pallidioribus.

Long. 6½ lin. ♂.

Mr. Belt's collection.

Oreodera C-album, n. sp.—Brevior, oblongo-ovata, modice convxa, ochreeo-fusca nigro-varia, elytris utrinque pone medium litura magna C-formi alba; thorace dorso 5-tuberculato, punctato: elytris apice subrecte truncatis, angulo exteriori leviter producto, supra prope basin utrin-

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que penicillato-cristatis, sparsim grosse punctatis, versus apicem nigro fulgurato-lineatis, litura C-formi cretacea dorsi, ad suturam spectanti, maculaque anteriori cretacea suturali; antennis fuscis, articulis 4-11 basi griseis; pedibus griseo et fusco variegatis, femoribus maxime clavatis.

Long. 5½ lin. ♂.

In Mr. Belt's collection.

Oreodera costaricensis, Thomson, Syst. Ceramb. p. 542. —Apparently abundant in Chontales. Also Costa Rica.

Oreodera inscripta, n. sp.—Breviter oblonga, sericeo-fusca, elytris pone basin penicillato-cristatis, prope apicem lineis nonnullis valde angulatis griseis, nigro-fusco marginatis, et vittulis nigro-fuscis connexis; capite ochreo-fusco, vertice pone oculos maculis duabus transversis nigro-fuscis; thorace dorso antico bituberculato, sparsim grosse punctato; elytris apice oblique truncatis, angulo exteriori dentiformi-producto, supra grosse sparsim punctatis, basi nullomodo granulatis; pedibus griseo et fusco variegatis.

Long. 4 lin. ♂ ♀.

Many examples. In the markings of the elytra, it much resembles *O. undulata*. Closely-allied, according to the description, to *O. corticina*, Thoms., of Mexico, which, however, is larger (5 lin.).

Genus Olenosus, nov. gen.

Sub-fam. *Acanthoderinæ*. Corpus elongato-oblongum. Caput antice breve, genis infra haud dilatatis; tuberes antenniferæ fortiter oblique elevatæ. Thorax transversus. lateribus medio dilatatis et unituberculatis. Elytra elongata, parallela, juxta apicem rotundata, apice ipso breviter vix truncata. Antennæ (♂) corpore triplo longiores setaceæ; articulo primo elongato-pyriformi, 3-11 subæqualibus haud ciliatis. Pedes elongati: femora subito clavata, tibiæ anticæ (♂) intus denticulatæ et apice dilatatæ: tarsi, tibiarum dimidio haud longiores, articulo primo cæteris longioribus, unguiculari brevi.

Closely allied to *Alphus* and *Æthomerus*, differing from both in the shape of the basal joint of the antennæ, which is more elongated, and forms a moderately abrupt elongate-oval club.

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Olenosus serrimanus, n. sp.—Elongatus, fusco-cinereo-tomentosus; thorace tuberibus dorsalibus obtusis quatuor: elytris carinis obtusis obliquis duabus, tuberculis tribus prope basin punctisque asperatis fuscis sparsis, fascia oblique nigro-fusca longe post medium; antennis et pedibus cinereis, fusco-annulatis.

Lon. 7-9 lin. ♂.

Several examples. Found also in Mexico, and known in some collections under the MS. name of *Alphus serrimanus*.

Æthomerus antennator, Fabr. Syst. Eleuth. II. p. 288. —In Mr. Belt's collection.

Myoxinus pictus, Erichson, Consp. Ins. Peru, p. 144. —Also found in Peru and on the Amazons.

Alphus cavifrons, n. sp.—Elongato-oblongus, convexus, pallide-fuscus; tuberibus antenniferis fortiter elevatis; thorace passim punctato, canescente, dorso fusco, tuberculis duobus nigris fortiter elevatis; elytris apice breviter truncatis, supra carina centro-basali elevata et 5-tuberculata, carina flexuosa abbreviata et lateribus prope humeros aspere tuberculatis, cæteris sublineatim granulato-punctatis, canis, plaga scutellare, altera laterale, et fascia recta ante-apicali, fuscis; antennis haud ciliatis, canis, articulis medio fuscis apice nigris; pedibus elongatis, canis, tibiis nigro-biannulatis, tarsis articulis 2-3, et 4to apice, piceo-fuscis.

Long. 7-7½ lin. ♂ ♀.

Many examples. In the elevated antenniferous tubers and sculpture, the species resembles the genus *Myoxinus*; but the longer and more gradually clavate scape of antennæ, and simple mesosternum, bring it within the definition of Gen. *Alphus*.

Alphus centrolineatus, Bates, Ann. N. H. Feb. 1862. —Found also in Venezuela, and in the Amazons region. It would belong to *Pycnomorphus*, Thoms., but I hold this to be a wholly untenable genus.

Steirastoma histrionica, White, Cat. Long. Brit. Mus. p. 354.—Also found in Mexico and Honduras.

Steirastoma senex, White, Cat. Long. Col. Brit. Mus. p. 353.—Also Mexico.

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Steirastoma albiceps, n. sp.—*S. senex* similis, elytris apice magis angustatis, nec truncatis; singulatim in spina valida terminatis; capite cano, genis nigris; elytris ochreo-fuscis, lateribus vitta trilobata fusco-nigra, loba 1ma longe ante, 2ndo pone medium, 3ia multo minori prope apicem; antennis (♂) articulo 3io vix curvato intus nec denticulato.

Long. 9 lin. ♂.

One example, in Mr. Belt's collection. Very closely allied to *St. senex* and *melanogenys*, both of which have truncated elytra, and denticulated third antennal joint. In the shape of the apex of elytra it agrees with *St. cænosa*, but differs widely in colours, in the three-lobed black lateral stripe, &c.

Acanthoderes inquinatus, n. sp.—Robustus, postice recte attenuatus, ochreo-fuscus, griseo et nigro parum variegatus, elytris plaga vaga obliqua a humeris usque ad medium disci extensa, maculaque triangulari communi infra scutellum, griseo-albis, pone medium fascia abbreviata valde flexuosa nigra; antennis (♂) corpore triente longioribus simplicibus, articulo 3io sequenti quarta parte longiori, 10mo quam 9o et 11mo multo breviori, barbato; thorace dorso tuberibus duobus grossis conicis, et carina dorsali fortiter elevata; elytris sub-brevibus, trigonis, apice breviter sinuato-truncatis, angulo exteriori longe spinoso, dorso carina centro-basali elongata, paulo curvata, et plurituberculata; antennis et pedibus griseo et nigro-fusco variegatis; mesosterno bituberculato, antice verticali.

Long. 6½-9 lin. ♂ ♀.

♀. Elytris minus trigonis, apice latius sinuato-truncatis.

Many examples.

Acanthoderes circumflexus, Duval, in De la Sagra's Hist. de Cuba, Insectes p. 270.—This is a widely distributed species; common in Cuba, Venezuela, New Granada, Guatemala, and Mexico. Some of the examples from Chontales are very large. However much the species may vary in size or markings, the short and broad undulated white fascia is always visible a little below the shoulder of each elytron, and extending to the disc. The two apical joints of antennæ are formed as in *A. inquinatus*.

Long. 4-7½ lin.

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Acanthoderes rubripes, n. sp.—*A. Daviesii* et *A. Swederi* proxime affinis, differt colore fusco-rufo et antennis articulis 3io et 4to apice dilatatis. Breviter ovatus, fusco-rufus, subnudus, capite infra oculos utrinque maculis duabus, verticeque quatuor (sæpe obsoletis) ochreo-flavis: thorace dorso bituberoso, inter tuberes bisulcato, sulcis et marginibus anticis et posticis grosse punctatis, lateribus ante et post tuberculum et disco ochreo-maculatis; elytris trigonis, apice late truncatis, angulo exteriori paulo producto, supra lævibus, prope basin pauciter aspere punctulatis, maculis ochreis utrinque circiter 14 (medio disci duabus minutis); antennis articulis 1-2 rubris, 3-9 testaceis apice nigris, 3-4 apice dilatatis; pedibus rubris, femoribus basi et apice nigris, tarsis fulvis; corpore subtus nigro-fusco, metasterno utrinque flavo-trimaculato; abdominis segmentis utrinque biseriatim flavo-maculatis, segmento basali medio bimaculato, apicali rufo.

Long. 5½-7 lin. ♂ ♀.

A small number of examples.

Acanthoderes lævicollis, n. sp.—*A. rubripedi* simillimus, differt colore rufo, thorace lævi, convexo, nitido, absque tuberibus et sulcis dorsalibus, elytrisque maculis majoribus utrinque 9 (medio disci macula unica); vertice et thoracis disco immaculatis; corpore subtus pedibus et antennis simillimis, metasterno medio rufo excepto.

Long. 5½-7 lin. ♂ ♀.

Many examples exactly similar. The co-existence in the same locality of two species so nearly identical as the preceding, is very remarkable; and had it not been for the striking structural difference of their thorax, and their constancy, I should have concluded them to be varieties. It may be added, that they are numbered as distinct in Mr. Belt's collection. *Acanthoderes Swederi* presents a chestnut-red variety, but this species is very distinct in its undilated third and fourth antennal joints.

Discopus quadriscopulatus, Thoms. Physis. II. 146.—Also found in Guatemala. In the proportion of the antennal joints, form of anterior tibiæ, and facies, this species differs greatly from *Discopus spectabilis*, the type of the genus, and demonstrates the impossibility in this group, of forming genera on peculiarities in the antennæ.

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Lagocheirus araneiformis, Lin. Syst. Nat. II. p. 625.—Several examples from Chontales, differing very slightly from the type form from Guiana and the Amazons region.

Lagocheirus cristulatus, n. sp.—*L. araneiformi* convexior, paulo minus elongatus postice magis angustatus, elytris basi haud transversim fusco-notatis, antennis griseo-annulatis. Pallide fuscus, thorace dorso 5-tuberculato, 2 anticis obtusis, 3 posterioribus fortiter elevatis, conicis; elytris apice juxta suturam breviter oblique et obtuse truncatis, medio baseos gibbosis, carina centro-basali antice dente forti erecto armato, deinde fasciculato-cristato, disco post medium obtuse 5 carinatis, carinis nigro-fasciculatis, punctatis, macula semicirculari laterali fusca apud medium antice in vittam marginali continuata, fasciaque lata valde flexuosa post medium, ochreo-grisea; antennis (♂) quam in *L. araneiformi* multo brevioribus, fuscis, articulis 3-6 griseo-biannulatis; tarsis omnino nigris.

Long. 9 lin. ♂.

Quite distinct from all the varieties of *L. araneiformis*. The lateral brown patch is more rounded, and advances much less towards the disc, than in *L. araneiformis*.

This species may, possibly, be the *L. obsoletus*, Thoms. Classif. des Ceramb. p. 10; but beyond the faintness of the usual markings of this genus implied in his description, none of the really distinguishing characters, nor the strongly flexuous pale fasciæ are mentioned; so that it must be a distinct allied species found in Mexico.

Lagocheirus præcellens, n. sp.—*L. araneiformi* differt colore purpureo-fusca, elytris minus parallelis, etc. Supra læte fuscescenti-purpureus; thorace dorso tuberibus 5 vix elevatis, obtusissimis, interstitiis grosse punctatis, maculis fuscis ut in *L. araneiformi*; elytris apice obtusissime suboblique truncatis, medio baseos tuberculo elevato, sed carina centro-basali haud distincta, penicillis nigris parvis lineatim maculatis, et passim fortiter punctatis, punctis postice nigris, pone medium fascia transversali (antice flexuosa et distincta postice fusco-marginata) maculaque apicali ad suturam canis; macula fusca laterali saturate purpurea, antennis fuscis, articulis 3-4 griseo bi- 5-10 uni-annulatis; pectore et abdomine medio griseis, lateribus fulvis; pedibus griseo et nigro variegatis, tarsis articulis 1-2 griseis, 3-4 nigris.

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Long. 9-10 lin. ♂ ♀.

Many examples. A handsome, brightly-coloured species, in fresh examples. It resembles *L. fasciculatus*, White, which, however, is a much shorter insect, with trigonal elytra.

Lagocheirus rosaceus, Bates, Trans. Ent. Soc. 1869, p. 386.—I have now seen many scores of examples of this handsome and distinct species, all presenting the same character.

Lagocheirus binumeratus, Thoms. Classif. des Ceramb. p. 9; (*L. V-album*, Bates, Trans. Ent. Soc. 1869, p. 385).—Of this species also, I have seen a very large number. Judging from the description, there appears to be no doubt of the identity of the *V-album* with the Mexican *binumeratus*. *L. plantaris*, Erichs., is a closely allied species from Peru, differing by its white belt across the elytra.

Lagocheirus simplicicornis, n. sp.—*L. araneiformi* formâ simillima, differt colore minus variegato, antennisque maris medio haud uncinatis. Oblongus, minus convexus, cinereo-fuscus, thorace dorso 5-tuberoso, passim punctato, elytris passim conspicue apicem versus minus grosse punctatis, prope basin pluri penicillatis, dimidio apicali quinque costato, macula laterali fusca, intus regulariter curvata, fascia lata valde flexuosa (postice bene definita et fusca marginata) quam colore fundi vix pallidiori; antennis ♂ corpore plusquam duplo longioribus, articulo 6o nullomodo armato, fuscis, griseo-annulatis; pedibus griseo et fusco variis, tarsis articulis 1-2 griseis, 3-4 nigris.

Long. 9 lin. ♂ ♀.

Remarkable from the absence of the hooked and bearded spine at the end of the sixth antennal joint of ♂, which is otherwise so constant a character of this genus.

Leptostylus viriditinctus, n. sp.—Elongato-ovatus, fortiter convexus, fuscus, thorace elytrisque plus minusve sericeo-viridibus, his apice ad suturam et (sæpe) macula postico-discoidali albis; capite fronte fulva, fusco-irrorata, vertice sæpe viridi; thorace disco tuberculis 5 fortiter elevatis, unoque utrinque sublaterali, interstitiis grosse discrete punctatis; elytris prope apicem acuminato-angustatis, apice ipso breviter truncatis et angulo exteriori

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dente longo obtuso, supra seriatim penicillato-tuberculatis, pone basin utrinque gibbosis, interstitiis grosse punctatis; antennis cinereis, articulis 1-3 et 5 læte fusco-irroratis, 3-11 apice fuscis; pedibus cinereo et fusco variegatis, tarsis articulo 1-2 cinereis, 3-4 rufis; mesosterno conico-elevato.

Long. 6½ lin. ♂ ♀.

Many examples. The antennæ are simple.

Leptostylus hilaris, n. sp.—Elongato-ovatus, convexus, supra cretaceo-albus, thorace medio, elytris plaga scutellari, macula laterali ante medium, circumflexu suturali pone medium, plagaque ante apicali polygona, nigro-fuscis; capite sordide cretaceo; thorace disco 5 tuberculato, unoque obtuso utrinque laterali, punctis paucis grossis; elytris prope apicem angustatis, apice breviter oblique truncatis, supra tenuiter seriatim penicillatis, punctatis, basi haud gibbosis; antennis griseo-albis, fusco irroratis, articulis apice fuscis; tarsis articulis 1-2 griseis, 3-4 piceo-rufis; mesosterno simplici.

Long. 6 lin.

The lateral fuscous spot of the elytra is similar to that of the *Lagocheiri;* it is continued along the sides to the base, and the colour projects as a second minor spot, a little anterior to the large one. The many-angled spot near the apex is transverse, and tridentate in front, deeply cleft on each side, and posteriorly it leaves the apex of the suture of the white ground-colour.

Several examples.

Leptostylus triangulifer, n. sp.—Ovatus, valde convexus, cinnamoneo-fuscus, plaga magna triangulari scutellari; thorace dorso tuberculis 5 parvis, lateribus haud tuberculatis, obtuse prominulis, dorso postice lineis brevibus longitudinalibus nigris; elytris postice abrupte declivibus, apice singulatim productis, sublobatis, obtusis, supra utrinque quadricostatis, costis penicillis fuscis ornatis; antennis et pedibus griseo-fuscis, illis basi irroratis, articulisque apice fuscis.

Long. 5-5½ lin.

Many examples.

Leptostylus transversus, Gyllenhal, in Schönh. Syn. Append. p. 164.—Differs in no respect from N. American

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specimens, except in the fuscous apex of the elytra being less dark, and the transverse ridge not conspicuous. This variety occurs also in New Granada. *L. pleurosticlus* (Bates), is very closely allied, but is a much shorter insect.

Leptostylus macrostigma, n. sp.—*L. transverso* forma similis, differt elytris macula laterali fusca maxima, usque ad discum extensa, et intus fascia curvata grisea marginata, versus apicem haud transversim fasciata nec elevata, sed linea fulgurata grisea nigro-marginata ornata; thorace dorso 5 tuberculato et tuberculis lateralibus conicis conspicuis; antennis testaceo-griseis fusco-maculatis; tarsis nigris, articulis 1 et 4 basi testaceo-griseis.

Long. 4 lin. ♂.

One example only, in Mr. Belt's collection.

Leptostylus pygialis, n. sp.—Breviter ovatus, convexus, fuscus, elytris postice macula communi griseo-alba; thorace dorso trituberculato, grosse punctato, obscure fusco, juxta marginem posticum lineola utrinque nigra; scutello nigro; elytris apice abrupte declivibus, brevissime vix truncatis, supra conspicue lineatim crebre punctatis, medio baseos leviter convexis, disco utrinque tricostatis, costis perpauciter penicillatis, fulvo-fuscis, basi et lateribus sæpe nigro-fusco-plagiatis, prope apicem macula oblonga communi alba; tarsis articulis 1-3 nigris basi griseis, 4 testaceo-rufo.

Long. 3-3½ lin.

Many examples.

Leptostylus leucopygus, n. sp.—Ovatus, quoad formam *L. maculæ* (Say) simillimus, fuscus, elytris triente apicali griseo-albo; thorace parvo, lateribus haud tuberculatis, dorso antico tuberculis duobus rotundatis, vitta utrinque nigra: elytris apice conjunctim acute rotundatis, supra lineatim punctatis, interstitiis alternis elevatis nigro-penicillatis, medio baseos haud elevatis, prope suturam ad basin planis confuse punctatis, parte apicali grisea antice recte delineata; antennis articulis 4-6 basi, 8-10 toto, flavo-testaceis.

Long. 2¼ lin.

Several examples.

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Leptostylus cristulatus, n. sp.—Ovatus, fuscus, elytris utrinque pone medium macula discoidali cinereo-alba; thorace antice prope marginem anticum tuberculis duobus magnis, alterisque duobus utrinque lateralibus: elytris apice acute rotundatis, supra crista centro-basali 4-tuberculata, disco seriebus tribus tuberculorum, antennis articulis 4-9 basi flavo-testaceis.

Long. 3¼ lin.

One example, in Mr. Belt's collection.

MECOTETARTUS, nov. gen.

Corpus elongatum, subdepressum. Antennæ ♂ris corpore quadruplo vel quintuplo longiores, articulo 1mo valido elongato, 3io quam primo duplo longiori infra longe dense et subtiliter ciliato, 4to maxime elongato corpore duplo longiori, basi infra ciliato apice infra barbato et paulo incrassato, cæteris normalibus tenuibus. Caput ut in *Leptostylo*, sed tuberis antenniferis magis validis. Thorax subquadratus, lateribus spina brevi post medium retrorsum spectanti. Elytra elongata apice singulatim acute paulo producta, supra sparsim tuberculata. Pedes validi; femora gradatim clavata; tarsi breves, articulo primo 2 et 3 conjunctis breviori. Corpus subtus planum; prosternum ultra coxas elongatum et valde dilatatum; mesosternum angustum; acetabula clausa. Tarsi antici nec dilatati nec barbati. Abdomen segmento apicali dorsali et centrali apice late emarginato. ♀. Antennæ normales, articulis 3 et 4 paulo elongatis, æqualibus vix ciliatis. Abdomen segmento apicali dorsali et ventrali acute rotundato.

A *Leiopus* form remarkable for the enormous length of the fourth antennal joint in the ♂.

Mecotetartus antennatus, n. sp.—Elongatus, griseo-fuscus, thorace vitta lata mediana obscuriori, dorso inæquali; elytris vitta laterali a humeris usque ultra medium nigro-fusca, dorso irregulariter elevato-lineatis (carina laterali magis distincta) et tuberculis acutis penicillatis conspersis, lineolisque nonnullis nigro-fuscis; antennis griseis, fusco-irroratis, articulis 4-10 apice fuscis.

Long. 6-8 lin. ♂ ♀.

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Many examples. The males vary greatly in degree of development of the antennæ. In one small example (6 lines) these organs are only about three times the length of the body. In a fine male in Mr. Belt's collection, the proportion is five and-a-half times.

Alcidion brachiale, n. sp.—Oblongum elytris subtrigonis, humeris haud prominulis, carina centro-basali brevi fortiter elevato: fulvo-fuscum, thorace dorso tuberculis duobus rotundis nigris, lateribus medio angulatim rotundatis: elytris lateribus postice rotundato-angustatis, apice singulatim triangulariter productis, supra carinis vix conspicuis duabus discoidalibus, longe ante apicem evanescentibus, tuberculis minimis fuscis conspersis, pone medium utrinque fasciola maculari nigra, pone hanc fusco-obscuro nebulosis; antennis fuscis, articulis 4-10 et 11 toto, griseo-testaceis, articulo 1mo subtus fortiter bicurvato: pedibus griseo et fusco variis, femoribus anticis subtus dente acuto, tibiis dento magno obtuso armatis.

Long. 3¾-4½ lin.

Several examples; all have the anterior legs armed as above described, and I cannot tell whether this is a sexual character. The direction of the oblique dark macular belt of the elytra is from the suture backwards, to the margin, and not from the suture forwards, as in *A. trivittatum*, which is a widely distinct species in other respects.

This may possibly be *A. adjunctum*, Thoms. (Physis. p. 544), but the description does not mention the chief distinguishing points of the species.

Lophopæum barbiscapum, n. sp.—Elongato-ovatum, parum convexum, olivaceo-fuscum, elytris nebula communi suturale ante medium, et pone hac fasciolo indistincta, obscure fulvis; thorace lateribus utrinque medio tuberculo valido conico recto, dorso tuberculis elevatis duabus nigris; elytris apice brevissime et obtusissime vix truncatis, supra cristis centro-basalibus erecte pilosis, nigris, seriebusque utrinque quinque penicillarum nigrarum, et squamis nonnullis albis: antennis nigro-fuscis, articulis basi angustissime griseis, scapo et articulis 2-4 infra ciliatis; pedibus nigro-fuscis, cinereo-irroratis.

Long. 5½ lin. ♂ ♀.

A small number of examples. The tawny marks of the elytra are indistinct, and variable in extent.

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Lophopœum scopiferum, n. sp.—*L. barbiscapo* simillimum, at differt elytris haud seriatim penicillatis. Nigro-fuscum, elytris utrinque pone medium fasciola valde biflexuosa fulva, postice nigro-marginata; thorace lateribus utrinque medio tuberculo valido conico recto, dorso tuberculis fortiter elevatis duobus, elytris apice conspicue truncatis, supra convexis, confuse punctatis, cristis centro-basalibus erecte elongato-pilosis; antennis articulis basi angustissime griseis, scapo et articulis 2-4 infra ciliatis.

Long. 4¼ lin. ♂ ♀.

Chontales. In this, and the preceding species, the sides of the elytra are not carinated.

Lophopœum saronoto, n. sp.—*L. carinatulo* simile at carinis centro-basalibus vix elevatis, longe nigro-penicillatis: elongato-ovatum, convexum, fuscum, elytris maculis numerosis magnis, et parvis obscurioribus, medio maculis nonnullis transversim positis, griseo-albis; thorace lateribus paulo post medium tuberculo conico acuto, dorso bituberculato; elytris brevissime vix truncatis; antennis fuscis, articulis basi angustissime griseis; pedibus flavo-testaceis. femoribus apice, et tibiis, fusco-annulatis.

Long. 3¾ lin.

In Mr. Belt's collection. Agrees with *L. carinatulum* in the absence of a lateral carina to the elytra, and in general form.

Ozineus arietinus, n. sp.—*O. mystico* affinis; elongatus, griseo-fuscus, elytris fasciis duabus pone medium albis, prima obliqua per suturam versus basin ascendenti, 2nda paulo posteriori flexuosa versus suturam recta; thorace inæquali pallido, disco nigricanti, spino laterali posteriori acuta retrorsum spectanti; elytris apice valde oblique truncatis, supra subtiliter, fasciis grossius, tomentosis, carina centro-basali modice elevata nigro-penicillata, dimidio basali grosse sublineatim punctato, versus suturam nigricanti; antennis pedibusque pallide testaceis.

Long. 3½ lin. ♂ ♀.

The apex of abdomen in the ♀ forms a very short ovipositor, visible within the obliquely truncated apices of the elytra.

Anisopodus phalangodes, Erichson, Consp. Faun. Col. Peru, p. 145.—This widely-distributed tropical Ameri-

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can species attains enormous development in Chontales, some males being 7½ lines in length of body, and 14 lines in length of hind-legs.

Anisopodus argus, n. sp.—Latior, depressus, ochreo-fuscus, elytris maculis plurimis rotundatis seriebus 4 digestis, maculaque majori obliqua pone medium, nigris; thorace brevi, disco maculis duobus nigris, elytris versus apicem tantum angustatis, apice profunde sinuato-truncatis, bispinosis, spina exteriori longissima, supra lateribus verticalibus, dorso crebre punctato, macula rotundata nigra prope basin paulo elevata; antennis pedibusque nigris, his, tibiis, tarsisque griseo-annulatis, pedibus posticis modice elongatis, femoribus apice clavatis.

Long. 7½ lin.

Several examples.

Lepturges infilatus, n. sp.—Elongato-ellipticus, depressus, fusco-testaceus, tomento griseo tenuiter vestitus, elytris maculis elongatis plurimis fusco-rufis subnudis, quarum tribus subsuturalibus, duabus basalibus, nonnullisque in fascias duas valde dentatis conjunctis, una pone medium, alteraque ante apicem; thorace trapezoidali, spina valida obliqua paulo ante basin, disco punctulato vittis irregularibus duabus rufo-fuscis; elytris dimidio basali punctulato, apice breviter obtusissime truncatis; antennis unicoloribus; femoribus tibiisque apice infuscatis.

Long. 4¼ lin. ♂ ♀.

The terminal abdominal segment is slightly elongated, and visible beyond the tips of the elytra in both sexes: in the ♀ the ventral plate is largely emarginated at the apex; in the ♂ it is entire and obtuse. The dark fascise on the elytra are very irregular, and apparently variable.

Also found in Mexico.

Lepturges limpidus, n. sp.—*L. infilato* simillimus, at differt segmento terminali abdominis utriusque sexus haud elongato obtuso; maculisque elytrorum paucioribus, et fascia mediana magis distincta; elongato-ellipticus, vix convexus, pallide rufo-testaceus, tomento cano-griseo tenuiter vestitus; elytris maculis elongatis rufo-fuscis, quarum una basali (sæpe curvata ad suturam), una elongata humerali, tribus medianis in fasciam valde dentatam

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digestis, binisque conjunctis ante apicem; thorace fasciis duabus irregularibus rufo-fuscis, pleuris vitta nigra; pedibus, corpore subtus, antennisque, omnino pallide testaceis, griseo tomentosis.

Long. 4-4½ lin. ♂ ♀.

Chontales.

Lepturges inscriptus, Bates, Ann. & Mag. Nat. Hist. Novem. 1863.—Also found on the Upper Amazons.

Lepturges calligramma, n. sp.—Oblongo-ovatus, vix convexus, dense subtiliter griseo tomentosus, elytris fascia pone medium undulata et angulata, macula transversa laterali ante medium, alteraque minori ante apicem, notulisque parvis suturalibus, nigris, distinctis albo-marginatis; thorace lateribus ante basin angulatis, nec spinosis, deinde oblique angustatis, supra lævi, macula parva nigra ad medium marginis anticis, alteraque simili ad marginem posticum; scutello nigro; elytris ovatis, apice sinuato-truncatis, angulo suturali distincto, exteriori longe producto acuto, supra lævibus; antennis nigris, articulo 2ndo griseo; pedibus griseis, tibiis basi et apice, tarsisque apice, nigris, femoribus clavatis; corpore subtus griseo.

Long. 3-3½ lin. ♂ ♀.

♀. Abdominis segmentum ultimum paulo elongatum, ventrali truncato.

♂. Segmentis ultimis, dorsali et ventrali, rotundatis.

Several examples.

Lepturges navicularis, n. sp.—*L. ovalis* simillimus, elongato-ovatus, convexus, at differt elytris griseis, plaga basali, vittis 3 vel 4 apicalibus, antice apud medium terminatis, fuscis; thorace transversim quadrato, convexo, spina utrinque ante basin acuta, obliqua, dorso griseo, plaga discoidali utrinque fusca; elytris apice breviter sinuato-truncatis, angulis omnibus productis, exteriori longiori, supra passim punctulatis; pedibus rufo-testaceis, femoribus clavatis, clavis fuscis; antennis rufo-testaceis, articulis 4-11 apice nigris.

Long. 3-3½ lin. ♂ ♀.

Lepturges lætabilis, n. sp.—Oblongo-ovatus, modice convexus, tenuiter castaneo-tomentosus, ochraceo læte

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pictus; capite supra ochraceo, vertice macula triangulari nigro-castanea, fronte grisea; thorace ochraceo, vitta lata dorsali castaneo, lateribus ante basin tumidis nec spinosis; elytris apice recte truncatis, angulo suturali rotundato, exteriori longe acute dentato, supra castaneis, vitta angulato-flexuosa, ab humeris usque ad medium disci extensa, trienteque apicali, ochraceis, hoc paulo ante apicem macula angulata laterali nigro-velutina; antennis articulo basali apice clavato, pyriformi, castaneis, articulis apice nigris; pedibus nigro-castaneis, tibiis medio griseo annulatis, femoribus clavatis, tarsis brevibus.

Long. 4½ lin. ♂ ♀.

♂. Segmento ultimo dorsali late rotundato.

♀. Segmento ultimo abdominali paululum elongato, apice obtuso.

Several examples of this pretty species, which resembles *L. calligramma* in shape of thorax, apex of elytra, femora, tarsi, and markings, but differs in the smooth pyriform club of the scape, which may indicate a generic difference.

Baryssinus bilineatus, Bates, Ann. & Mag. N. H. January, 1864.—Also found on the Upper Amazons.*

Chætanes setiger, Bates, Ann. & Mag. N. H. January, 1864.—This species is widely distributed: I have specimens from Cayenne, the Upper Amazons, and Ecuador, besides Chontales.

Atrypanius conspersus, Germar, Ins. Sp. Nov. p. 474. —Still more widely distributed than the preceding,

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* The following forms the third described species of this genus:—

Baryssinus bicirrifer.—*B. bilineato* longior, elytris magis parallelis, ♀ ovipositore duplo longiori. Parallelopipedus, testaceo-griseus, thorace vittis albo-griseis, lateribus medio nigro-fuscis. Thorax ut in *B. bilineato* convexus, ante spinam rotundatus, pone spinam subito et fortiter angustatus. Elytra postice gradatim declivia, apice late obtuse truncato, lateribus rectis; supra basin versus fortiter punctatis, carinis centro-basalibus vix elevatis, penicilla angusta cirriformi ornatis, colore fundi rufo-testaceo, griseo tomentoso, lateribus indeterminaté fuscis. Antennæ rufo-fuscæ, articulis basi late griseis. Pedes rufo-fusci, tibiis tarsisque griseo-annulatis.

Long. 4¼ lin. ♀, ovipositoris ¾ lin.

♀. Ovipositor tubuliformis, segmento ventrali recte truncato.

Constancia, Rio Janeiro (Rev. H. Clark).

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occurring in every well-explored locality, in the lower wooded region, from Rio Janeiro to Mexico.

Probatius mexicanus, Thoms. Classif. des Ceramb. p. 17. —Very closely allied to the common Brazilian *P. humeralis*, differing only in the humeral red streak extending along the sides of the elytra to the apex. As its name implies, it is found also in Mexico.

Trypanidius mexicanus. Thoms. Classif. des Ceramb. p. 8.—Differs from the well-known *T. dimidiatus*, of South Brazil, to which it bears the closest possible resemblance, by the absence of tubercle from the mesosternum. This tubercle has been considered a generic character of *Trypanidius*. The whitish angular patch at the apex of the elytra does not end in a point on the suture, as in *T. dimidiatus*, but is rather broad at that part, and slightly emarginated. *T. mexicanus* occurs also in Equador.

Trypanidius rubripes, n. sp.—Elongato-ovatus, valde convexus, fulvo-fuscus, elytris utrinque macula transversa, pone medium et prope suturam, nigro, duabusque lateralibus (prima ante medium 2nda exteriori ante apicem) canis; thorace dorso lævi, lateribus mox pone medium tuberculo obliquo conico: elytris apice breviter oblique truncatis, supra passim sparse (prope basin aspere) punctatis: antennis rufo-piceis, articulis apice nigris, basi (a tertio) anguste griseis; pedibus castaneo-rufis, parce griseo-squamosis, tarsis pallidis; mesosterno medio bituberculato.

Long. 8½ lin. ♀.

A fine species, allied to *Tr. geminus* (Pascoe), of Cayenne. One example in Mr. Belt's collection.

Œdopeza Pogonocheroïdes, Serville, Ann. Soc. Ent. Fr. 1835, p. 88.—A widely distributed species. Amazons, Cayenne, Panama, Nicaragua.

Œdopeza guttigera, Bates, Ann. & Mag. Nat. Hist. Feb. 1864.—Also found in Mexico.

Nyssodrys punctatella, n. sp.—*N. sedatæ* simillima, differt thorace passim, elytrisque magis crebre, punctatis; oblongo-ovata, convexa, fulvo-fusca, supra omnino punctulata,

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et nigro-fusco minute irrorata, elytris macula vel semifascia triangulari laterali pone medium grisea, apice breviter oblique truncata; thorace ante basin tuberculo laterali conico, et pone hoc obliquissime recte angustato.

Long. 4½-5½ lin. ♂ ♀.

♂. Segmento ultimo ventrali ut in *N. sedata* fortiter emarginato.

♀. Segmento ultimo abdominali tubuliforme, sed brevi.

Many examples.

Nyssodrys contempta, Bates, Ann. Mag. N. H. Feb. 1864.—Also Mexico. This species is distinguished from *N. lentiginosa* (Amazons) solely by its more coarsely punctured, and slightly bicostate elytra; the prominence of the thoracic spines, and the vitta of the thorax, vary in different specimens.

Nyssodrys caudata, Bates, Ann. Mag. N. H. Feb. 1864. —Widely distributed. Cayenne, Amazons, Nicaragua.

Nyssodrys deleta, Bates, Ann. Mag. N. H. Feb. 1864. —Equally widely distributed with the preceding.

Nyssodrys polygramma, n. sp. — Elongato-elliptica, angusta, castanea, tenuiter sericeo-tomentosa, capite thoraceque linea centrali vittaque lata laterali, elytris lineolis utrinque 4 prope suturam, alterisque tribus paulo latioribus lateralibus, et binis transversis ad apicem, ochreo-flavis: fronte flavo trilineata: thorace postice paululum dilatata, ante basin utrinque tuberculo brevissimo: elytris apice sinuato-truncatis, angulo suturali breviter, exteriori longe, spinosis, supra dorso plano, lineatim punctato; antennis pedibusque obscure castaneis.

Long. 4½ lin. ♂ ♀.

♂. Segmento ultimo apice lato; dorsali anguste, ventrali late, emarginato.

♀. Ovipositor elongatus (ultra elytras 1 lin.), apice integro.

An elegant and prettily marked species. The dark yellow lines near the suture are generally, from the second, slanting posteriorly towards the suture, and the

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third anteriorly, but these are sometimes united. There is, also, in some examples, a fine sutural yellow line near the apex.

Many examples.

Nyssodrys roseicollis, n. sp.—Elongato-ovata, vix convexa, fusco-nigra, tenuiter tomentosa; thorace antice maculis magnis duabus rosaceis; elytris vitta regulari submarginali flava; capite nigro, vitta centrali ochracea; thorace brevi transverso, ante basin vix dilatato, haud spinoso, supra fusco-nigra, pone maculam rosaceam utrinque vitta lata sordide alba, fasciaque ejusdem coloris mediana; elytris apice sinuato-truncatis, utroque angulo æqualiter dentato; corpore subtus, antennæ et pedibus nigris, griseo-tomentosis, femoribus basi rufo-testaceis.

Long. 2¾-3 lin. ♂ ♀.

♂. Segmento ultimo dorsali obtuso, ventrali leviter emarginato.

♀. Ovipositor brevissimus; segmento dorsali lanceolato.

Many examples.

Nyssodrys leucopyga, n. sp.—Ovatus, convexus, obscure fuscus; thorace vittis indistinctis sex sordide fulvis; elytris triente apicali cinereo; capite piceo, pone oculos cinereo-fulvo: thorace lato, usque ad spinas regulariter dilatato, his paululum ante angulos sitis, fortibus, postice spectantibus: elytris oblique, obtuse truncatis, supra fortiter punctatis, basi fulvo-maculatis; antennis pedibusque piceis.

Long. 2¾-3¼ lin. ♂ ♀.

♂. Segmento ultimo dorsali leviter emarginato, ventrali obtuso.

♀. Ovipositor paulo ultra elytras extensus, segmento dorsali obtuse rotundato.

Many examples. In form and colour much resembling the genus *Leptostylus*.

Hylettus cœnobita, Erich. Consp. Ins. Peru, p. 145.—A widely distributed species. Amazons; Peru; Nicaragua.

Astynomus mucoreus, n. sp.—Oblongus, convexus, fuscus, corpore subtus, apiceque elytrorum, tomento griseo-albo

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mucorem simulante vestitis; fronte nigra; thorace fulvo postice nigro-maculato, tuberculis lateralibus mox pone medium magnis; elytris breviter oblique sinuato-truncatis, supra versus basin aspere punctulatis, ibique purpurascenti-fuscis, vittis obliquis fulvis litera X communi simulantibus ornatis, ramis posticis nigro-marginatis; antennis fuscis, articulo basali, cæterisque basi, cinereo-fulvis; pedibus fuscis, femorum clava, tibiis annulis duobus, articuloque basali tarsorum canis.

Long. 5-6 lin. ♂ ♀.

Several examples. Also found in New Granada.

Astynomus vexillaris, n. sp. — Oblongus, convexus, erecte setosus, brunneus; elytris utrinque linea obliqua, apud humeros furcata, usque ad suturam extensa, sutura et plaga apicali, ochraceis, maculisque duabus angulatis, post medium et ad apicem, nigro-piceis velutinis, ochraceo-marginatis; capite ochraceo, vertice maculis duabus fuscis; thorace ochraceis, vittis duabus latis contiguis, sericeo-brunneis; scutello fusco, medio ochraceo; elytris apice breviter oblique sinuato-truncatis; antennis (♂ ♀) corpore nec multo longioribus, fulvo-ochraceis, articulis (a 3io) apice fuscis; pedibus cinereo-ochraceo tomentosis, tarsis articulo unguiculari rufescenti.

Long. 6-7 lin. ♂ ♀.

A very handsome and distinct species; the thoracic tubercles are conical, and situated a little behind the middle. The sutural interval between the four velvety brown spots of the elytra, is sometimes varied with black lines; the anterior pale lines of the elytra, enclose an æquilateral triangular spot of the brown ground-colour.

Astynomus setiger, n. sp.—Oblongus, modice convexus, cinereo-ochraceus; thorace vitta lata dorsali; elytris maculis tribus lateralibus, duabusque suturalibus, nigro-fuscis, sericeis: capite nigro, linea verticis ochracea; thorace tuberculo valido mox pone medium, fascia dorsali medio ochraceo trimaculata; elytris dense erecte setosis, apice breviter, fortiter, emarginato-truncatis, supra passim punctatis (punctis setigeris), macula prima suturali majori scutellari, 2nd lineari pone medium, interdum cum macula 2nda laterali subconnexa; antennis nigro-fuscis, articulis (a 3is) basi griseis; pedibus fuscis, griseo-variegatis.

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Long. 4¼-6½ lin. ♂ ♀.

Sent sparingly by Mr. Belt. Like *A. vexillaris*, the antennæ are not much (in ♂ about a fourth) longer than the body, and stout.

CARPHINA, nov. gen.

Gen. *Eutrypano* affine. Corpus oblongum, modice elongatum, supra modice convexum. Caput thoracis parte antica latiori, fronte ut in *Eutrypano* brevi; oculi supra haud approximati, infra breves subquadrati. Thorax ab apice rotundato-dilatatus, pone medium tuberculo parvo retrorsum oblique spectanti, et pone hanc sinuatim angustatus. Elytra oblongo-quadrata, postice angustata, apice truncata, utrinque carina laterali, distincta, a humero usque ultra medium munita; epipleuris interdum breviter carinatis. Pedes modice elongati; femora clavata. Tarsi anteriores ♂ haud dilatati: ovipositor ♀ ut in *Eutrypano* modice elongatus.

This genus is necessary for the reception of numerous rather small species, differing from *Eutrypanus* in the distinct and elongated lateral carinæ of the elytra, and in the form of the thorax. They have no resemblance in facies to *Colobothea*, although agreeing with that genus in some of their characters. Their dress, in its streaky-brown coloration, resembles the bark of certain trees.

Carphina arcifera, n. sp.—Oblonga, supra vix convexa, fusca; thorace medio vittis duabus (interdum interruptis), elytrisque strigis brevibus posticis, nigris, his utrinque plaga magna laterali, intus arcuata, griseo, fusco-strigosa, lineisque curvatis apicalibus griseis; capite fusco, vertice nigro bimaculato; thorace dorso inæquali, episternis nigro fuscis; elytris apice oblique sinuato-truncatis, angulis omnibus paulo productis, supra sublineatim punctatis, costulisque setiferis flexuosis; antennis piceo-fuscis, articulis (a 3io) basi late testaceis; pedibus fusco et griseo variis et sericeis, tibiis fusco biannulatis; tarsis basi griseis, articulis 2-3 fuscis, 4to rufo-testaceo; corpore subtus griseo-sericeo.

Long. 4½-5½ lin. ♂ ♀.

Many examples. Very closely allied to *C. ligneola*, from which it differs, besides its broader shape, by the

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two transverse bent tawny gray lines near the apex of each elytron, the sutural and apical margins being also tawny gray.

Colobothea lignicolor and *ligneola*, and *Eutrypanus asula* (Bates, Ann. & Mag. N. H. March, 1860) belong to this genus.

Synchyzopus geometricus, n. sp.—Species elegantissima. Modice elongatus, convexus, postice perparum angustatus, supra fusco-nigra velutinus, thorace margine toto, elytris lineis transversis quatuor, et corpore subtus, sulphureis; capite ut in *C. cinctipenne* angusto, sulphureo, vittis duabus epistomatem haud attingentibus, sed usque ad occipitem, extensis, nigris; antennis elongatis, setaceis, setis brevissimis et sparsis vestitis, nigris, basi griseo-sulphureo lineatis; thorace quam in *C. cinctipenne*, multo latiori, lateribus medio rotundato-tumidis, supra regulariter convexis, lævibus; elytris thorace basi duplo latioribus, apice late truncatis, angulis exterioribus spinosis, supra dorso basin versus planis, haud costatis, breviter setosis; pedibus nigris, sulphureo-griseo tomentosis; tarsis articulis 1-2 sulphureo-griseis.

♂. Segmentum abdominale ultimum apice truncatum.

♀. Ovipositor valde elongatus, tubularis; segmentum dorsale lanceolatum, ventrale truncatum.

The transverse yellow lines or fasciæ of the elytra are thus placed:—The first runs from below the shoulder, rather obliquely, to near the suture, thence mounting to the scutellum; the second, about the middle of the elytron, runs more obliquely backwards, and passes along the suture itself to the curved subapical or fourth fascia; the third, between the second and fourth, does not reach the suture; the first, second and third are united by a marginal yellow line. Underneath, the metasternal episterna, and the sides of the second and third abdominal segments are blackish.

Many examples.

Priscilla Hypsiomoïdes, Thomson, Syst. Ceramb. p. 30 (1864); (*Colobothea dioptica*, Bates, Ann. Mag. N. H. Mar. 1864).—Several examples of this remarkably short and thick Colobotheine form were sent by Mr. Belt. It occurs also at Cayenne and on the Amazons.

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Colobothea Chontalensis, n. sp.—*C. viduæ* proximæ affinis, simillima, at differt thoracis disco lineolis tribus albis (duabus marginem anticum, tertia intermedia marginem posticum, annexis). Minus elongata, oblonga, nigra, vertice lineolis duabus postice divergentibus griseo-albis; thorace medio regulariter rotundato, lineolis tribus dorsalibus (2 anterioribus, 3ia posteriori intermedia) linea laterali et vitta lata episterni griseo-albis; elytris paulo attenuatis, apice recte truncatis, angulo exteriori spinoso, dorso maculis parvis irregulariter sparsis (nonnullis suturalibus), macula majori discoidali, alteraque minori rotundata intra apicem, griseo-albis; antennis fusco-nigris, articulis, (a 4to) basi griseis; corpore subtus albo-griseo.

Long. 4¼-8 lin. ♂ ♀.

♂. Segmentum ultimum ventrale latum, medio lobato, apice utrinque producto cornuto penicillato.

♀. Segmentum ultimum dorsale apice latum, leviter emarginatum; ventrale truncatum angulis productis.

Many examples.

Colobothea ramosa, n. sp.—*C. leucophææ* proxime affinis, differt colore griseo elytrorum in plagas tres communes colligato, prima et segunda lateraliter ramosa. Minus elongata, nigra, vertice lineis duabus postice divergentibus albo-griseis; thorace ovali, pone medium latiori et postice sub-constricto, vitta lata dorsali albo-grisea, medio maculis duabus nigris longitudinaliter posticis, lateribus punctis duabus (interdum obsoletis) episternique vitta lata albo-griseis; elytris apice flexuoso-truncatis, angulo exteriori spinosa, supra plagis tribus communibus (e maculis aggregatis) ad suturam conjunctis, griseo-albis, 1ma basali ramulo versus humerum emittenti, 2nda mediana, ramulo obliquo ascendenti laterali emittenti, 3ia ovali apicali.

Long. 6 lin. ♂ ♀.

♂. Segmentum ultimum dorsale medio productum longe bidentatum; ventrale late emarginatum, angulis longe productis.

Several examples, all males.

Colobothea hebraica, Bates, Ann. & Mag. N. H. March, 1865.—Many examples, also Mexico.

Colobothea unilineata, n. sp.—*C. hebraicæ* simillima, at differt linea alba verticis unica. Modice elongata fusco-

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nigra, capitis vertice linea unica albo-grisea; thorace ab apice usque ad basin recte dilatato, ad basin nullomodo constricto, dorso lineis duabus bene separatis, extus macula parva vittaque angusta laterali griseo-albis; elytris postice attenuatis, apice truncatis, angulo suturali recto, exteriori spinoso, supra maculis tesselatis, precipue a basi ad discum et ante apicem aggregatis, griseo-albis, margine apicali grisea, ante hoc spatio nigro immaculato; antennis nigris, articulis basi griseo-annulatis; pedibus griseo-annulatis.

Long. 6 lin. ♂ ♀.

Segmentum ultimum ♂ apice angustatum, simplice; ♀, magis elongatum et angustatum.

Many examples.

Colobothea dispersa, n. sp.—*C. lucariæ* simillima, at differt elytrorum apice haud albo-marginato, sed ad suturam macnlato; modice elongata, fusco-nigra, capitis vertice lineis duabus albis postice divaricatis; thorace ab apice ad basin dilatato, supra vittis subangustis quatuor, griseo-albis, quarum duabus lateralibus; elytris postice conspicue attenuatis, ad basin thorace latioribus, apice truncatis, angulo exteriori longe spinoso, supra maculis paucis griseo-albis, a basi ad disci medium et ante apicem sub-aggregatis, guttis nonnullis suturalibus, et macula unica apicali ad suturæ angulum; antennis nigris, griseo-annulatis.

Long. 5-6½ lin. ♂ ♀.

♂. Segmentum ultimum ventrale apice latum, utroque angulo in cornu valido penicillato producto; segmento dorsale angustatum, bifidum.

♀. Segmentum ultimum ventrale semitubulare, apice late emarginatum, angulis productis acutis.

♂ and ♀ in Mr. Belt's collection.

Colobothea distincta, Pascoe, Trans. Ent. Soc. V. 3rd Ser. p. 284.—One example, in Mr. Belt's collection. Found also at Sta Martha, New Granada.

Colobothea bitincta, n. sp.—*C. contaminatæ* affinis, at differt maculis elytrorum varicoloribus. Magna, elongata, parallela, nigro-fusca; capitis vertice linea mediana, alterisque duabus lateralibus, fulvo-griseis; thorace ab apice ad basin dilatato, fulvo, octolineato, lineis duabus,

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utrinque lateralibus; elytris vix attenuatis, truncatis, extus spinosis, supra guttis griseo-fulvis sparsis, fasciolaque utrinque pone medium lunuliformi, et macula ante apicem, albo-griseis, margine apicali albo-ciliato; antennis nigris, articuli sexti dimidio dense albo-tomentoso, 4to basi griseo; pedibus griseo-variis.

Long. 10-11 lin. ♂ ♀.

♂. Segmenta ultima (abdominale et ventrale) apice late emarginata, angulis productis.

♀. Segmentum ultimum abdominale modice elongatum; ventrale leviter emarginatum, dorsale obtusum.

Many examples.

Carneades superba, Bates, Trans. Ent. Soc. 1869, p. 387.—Many examples. *Colobothea grandis* (Thomson) from Mexico, belongs also to this genus; it is closely allied to *C. superba*, but differs, *inter alia*, in its 8-spotted thorax.*

Carneades delicia, Bates, *l. c.*, p. 387.—Apparently much rarer than the preceding.

Phœa scuticollis, n. sp.—*Ph. acromelæ* affinis; cylindrica, melleo-flava, elytris nigris, antennis apice fuscescentibus: fronte convexa, vertice plana; thorace antice et postice fortiter transversim sulcato, parte mediana lateribus tumida, dorso lamella elevata, convexa, lateraliter acute carinata, supra punctata, armato: elytris grosse lineatim punctatis.

Long. 5-5¼ lin.

The curious elevation on disc of thorax, has sharper and more projecting edges than in *Ph. acromela*, or in *Ph. Astatheoides*.

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* The following elegant species also belongs to this new genus:—

Carneades glaucothea, n. sp.—Caput et thorax angusta, triangulum formantia, elytris basi latis, rectis, postice attenuatis, apice truncatis et utrinque bispinosis; corpore nigro, pube tenui griseo induto; vertice thoraceque linea centrali albo-grisea; elytris sutura, margine apicali, fasciisque duabus obliquis, 1ma haud procul a basi, altera pone medium, griseo-albis; fasciis per epipleuras continuatis, 1ma angulata, 2nda dilatata; lineola laterali ante apicem etiam grisea; corpore subtus tenuiter griseo-pubescenti; antennis nigris articulis basi griseis; pedibus nigris, griseo vix annulatis.

Long. 6 lin. ♀.

Macas, Equador (Buckley).

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Phœa lineola, n. sp.—Cylindrica, elongata, rufo-coccinea, setosa, elytris vitta abbreviata prope basin, antennis (articuli primi dimidio basali excepto) geniculis, tibiis et tarsis (articulo unguiculari rufo-excepto) nigris; capite vix convexo, grosse sparsim punctato; thorace antice haud profunde, postice fortiter sulcato, disco simpliciter convexo, grossissime punctato; elytris dimidio basali lineatim punctato, posticali sublævi.

Long. 4¼ lin.

Var.? lineola nigra deficienti; abdomine apice interdum nigrescenti.

Two examples of each variety received.*

Lycidola Beltii, n. sp.—*L. palliatæ* et *simulatrici* affinis, elytris adhuc magis dilatatis: supra ochreo-fulva, triente

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* Add:—*Phœa rufiventris*, n. sp.—Elongata, sublinearis, nigra nitida, setosa, abdomine coccineo, elytris fusco-nigris; thorace ♂ ris plaga mediana transversa, ♀ nse macula magna postico-laterali coccinea; capite punctato; thorace tuberibus tribus magnis transversim positis, parum punctatis, nitidis; elytris lineatim haud grosse, apicem versus confuse punctatis.

Long. 4½-6 lin. ♂ ♀.

Mexico (Boucard).

The female is much larger than the male, and the tubercles of the thorax are much more elevated. Besides the sexual difference in colour mentioned above, the ♀ has a red spot on each side of the metasternum.

Phœa vitticollis, n. sp.—Elongata, sublinearis, nigra subnitida, nigro-setosa, capite thoraceque melleo-fulvis, hoc dorso vittis duabus postice conjunctis et episternis nigris; capite punctato, interdum nigro-maculato, fronte inter antennas depressa; thorace tubere utrinque elongato postico-laterali, medio dorsi vix convexo, sparsim punctato; elytris versus basin lineatim, versus apicem confuse punctatis; corpore subtus nigro nitido.

Long. 5 lin. ♂ ♀.

Mexico (Boucard).

Phœa tenuata, n. sp.—Angustissima, linearis, nigra nitida, setosa; capite rufo, rugoso-punctato; thorace cylindrico, sulcis transversis obsoletis, dorso vix convexo, omnino grosse scabroso-punctato; elytris grosse sublineatim punctatis.

Long. 3 lin.

Mexico.

Phœa semirufa, n. sp.—Angusta, linearis, nigra, setosa, capite, thorace, dimidioque basali elytrorum (vitta suturali excepta) melleo-rufis; capite discrete punctato, thorace elongato cylindrico, sulcis anteriori et posteriori profundis, medio dorsi obtuse longitudinaliter bicarinato, grosse sparsim punctato; elytris lineatim crebre grosse punctatis; corpore subtus nigro grosse punctato, prothorace melleo-rufo, vitta lata utrinque nigro, coxis omnibus, articulisque (a 5to) antennarum basi, fulvis.

Long. 3¾ lin.

Mexico.

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apicali elytrorum (antice undulato) violaceo-nigro; capite vitta verticali fronteque nigris, hac macula mediana fulva; thorace brevi, transverso, vitta dorsali nigra; elytris paulo post basin foliaceo-ampliatis, utrinque 4 carinatis, 2-3 ante apicem in una conjunctis; antennis nigris; corpore subtus nigro, coxis femorumque basi flavo-testaceis; prosterno latiusculo, quam in *L. simulatrice* angustiori, mesosterno latissimo quadrato.

Long. 4½-7 lin. ♂.

Several examples of this distinct species, all females.

Hemilophus prolixus, n. sp.—Valde elongatus, sublinearis, fulvo-ochreus; antennis nigris, corpore subtus lateribus, tibiis, tarsis, vittaque verticis, fuscis; capite aureo-fulvus, fronte modice convexa, tuberibus antenniferis antice fuscis; thorace cylindrico, ad basin nullomodo angustato; elytris ad humeros perobliquis, vix thorace latioribus, apice rotundatis, carina laterali valida integra, epipleuris parallelis, disco lineatim punctulatis, interstitio quarto paulo elevato; antennis articulis 1-3, et 4 infra, dense et longe nigro-penicillatis, cæteris tenuibus, sparse setosis.

Long. 6 lin.

One example, in Mr. Belt's collection.

Isomerida picticornis, n. sp.—*I. albicolli* proxime affinis, at gracilior; nigro-fusca, antennis articulis 5-6 testaceo-albis; capite thoraceque flavo-griseis, vitta mediana fusca ad thoracis basin dilatata; elytris parallelis, apice rotundatis, dorso sublineatim punctatis, sine linea elevata; subtus, pro et mesosterno, coxis, femorumque basi, melleo-flavis.

Long. 4½ lin.

Several examples.

Isomerida albicollis, Casteln. Hist. Nat. Col. II. 488. —A variety in Mr. Belt's collection, differing from Amazons and Cayenne specimens of this species, only by an indistinct pale vitta on the disc of the elytra.

Isomerida subdilatata, n. sp.—Vix convexa, elytris pone medium usque prope apicem leviter dilatatis; rufescenti-fulva, elytris interdum (basi exceptis) nigrescentibus; antennis nigris, articulis basi (a 3io) angustissime albo-

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testaceis, articulo 3io quam 4to fere dimidio longiori, cæteris gradatim vix decrescentibus, omnibus (3-7, præcipue in ♀, densius) infra nigro-ciliatis; thorace breviter cylindrico, basi nullomodo angustato; elytris apice obtusissime rotundatis, carina laterali valida, epipleuris postice explanatis, dorso planis, dense punctulatis; abdomine, tibiis et tarsis, fusco-nigris.

Long. 4½-6 lin. ♂ ♀.

Many examples.

Amphionycha princeps, n. sp.—Species formosa *A. Dianæ* similis, at magis elongata: testaceo-fulva, supra pube tenui clare fulvo-brunneo induta; fascia occipitali, vitta thoracis laterali (intus sinuata) maculis utrinque tribus elytrorum (1ma basali fascia-formi sutura attingenti, 2nda pone medium rotunda, 3ia ante apicem reniformi) cretaceo-albis, fusco-marginatis; capite antice modice convexo, lato, epistomate et orbitu inferiori albis; thorace prope basin leviter angustato; elytris elongatis, subparallelis, apice breviter sinuato-truncatis, angulo suturali paulo producto, exteriori breviter spinoso, carina laterali valida; antennis (♂) corpore plusquam dimidio longioribus, articulo 3io cæteris distincte longioribus, 3-6 sparsim infra-ciliatis; subtus, pectore lateribusque (ad basin) abdominis cretaceo-albis; pedibus melleo-flavis, nitidis.

Long. 7½ lin. ♂.

One example, in Mr. Belt's collection.

Amphionycha bifasciata, Bates, Trans. Ent. Soc. 1869, p. 386.—This is very closely allied to the celebrated *Amphionycha Knownothing*, of Thomson, which name its author subsequently (1868) changed to *A. Druryi*, stating, at the same time, that its habitat is Mexico. *A. bifasciata* seems to differ constantly in the gray colour of its elytra, and the narrow black margins to the yellow fasciæ. Mr. Belt has taken a large number of examples.

Amphionycha albaria, n. sp.—Minus elongata, rufo-testacea, albo-plagiata; capite antice bituberoso, cretaceo-albo, tuberibus fulvis; thorace ad basin distincte constricto, cretaceo-albo, linea dorsali, vittaque utrinque laterali, fulvis; elytris postice angustatis, apice obtuse rotundatis, carina laterali flexuosa valida, fascia basali communi (lateraliter abbreviata), plaga magna communi triangulari ante

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medium, macula utrinque transversa quadrata pone medium, et macula magna communi ante apicem, cretaceo-albis; antennis (♂) corpore duplo longioribus, sparsim tenuiter setosis, melleo-rufis, nitidis; pedibus testaceo-flavis, nitidis; corpore subtus omnino cretaceo.

Long. 5½ lin. ♂.

One example, in Mr. Belt's collection. It is closely allied to *A. princeps*, but the prominences on the forehead show a relationship to the genus *Phœbe*.

Amphionycha capito, Bates, Ann. Mag. Nat. Hist. June, 1866.—A unique example, possibly distinct, differing from the type (from Panama) in the head being white, with a black spot on the occiput, and another behind each eye.

Cirrhicera Sallei, Thomson, Archiv. Entom. I. p. 310. —Also found in Mexico.

Eulachnesia, nov. gen.

Inter *Amphionychinas* et *Ærenicinas* medium tenet. Caput exsertum; elytra lateraliter carinata; ungues fissiles; antennæ elongatæ, robustæ, omnino infra dense ciliatæ, articulo 3io quam 4to dimidio longiori. Corpus ut in Gen. *Amphionycha* elongatum, postice attenuatum; tibiæ intermediæ extus integræ.

The head in this genus is not retractile as in the *Amphionychinæ*, to which it belongs by the carinated elytra; and it differs also from them in the thick, filiform, and densely ciliated antennæ. The eyes are more distant from the prothorax even than in *Ærenica*. The type will be *Amphionycha Sapphira* (Bates, Ann. Mag. N. H. June, 1866), with which the following beautiful species is to be associated, having the same peculiar style of coloration.

Eulachnesia smaragdina, n. sp.—*Eu. Sapphiræ* affinis; elongata, postice attenuata, supra tomento vel potius squamis tenuibus, densis, smaragdinis, induta, capite postice vittis 5 thoraceque vittis tribus, nigris; elytris utrinque maculis subquadratis, duabus (una humerali altera discoidali post medium) aurantio-flavis; capite pone oculos paulo dilatato, elongato, convexo; thorace cylindrico, medio leviter dilatato, ante basin paulo constricto; elytris apice angustis, brevissime truncatis,

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angulo suturali acuto; supra punctulatis, lineis utrinque duabus dorsalibus paulo elevatis, carina laterali obtusa, longe ante apicem terminanti: antennis nigris, articulo 11mo precedenti breviori, acuminato, unguiculari; corpore subtus pedibusque plumbeo-viridibus.

Long. 7 lin.

One example, in Mr. Belt's collection.

Antodyce cretata, n. sp.—*A. pictâ* multo major et robustior; fusca, prothoracis et pectoris lateribus maculis numerosis, subtesselatis, cretaceis; elytrorum dimidio apicali eodem colore marmorato, abdominisque segmentis 4 basalibus plagis lateralibus magnis cretaceis: antennis (articulis 2 basalibus fuscis exceptis) pedibusque pallide flavo-testaceis; corpore valde elongato, lineari, setoso; capite fusco, fronte medio flava; oculis magnis, convexis, supra fere contiguis, occipite post oculum utrinque macula cretacea; elytris punctulatis, dorso planatis, notulis nonnullis humeralibus cretaceis; vitta suturali grisescenti, maculis posticis cretaceis, fulvo-fusco marginatis, macula ante-apicali majori, reniformi, alteraque juxta apicem angustiori, angulata.

Long. 7 lin.

One example of this handsome species, in Mr. Belt's collection. The spots, in the only species previously described, *A. picta* (Klug), are of a clear gamboge-yellow; in *A. cretata* they are chalky-white, and are formed by so compact a mass of fine tomentum, that they have almost the surface of hardened chalk.

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ADDENDA.*

Ophistomis nigellus, n. sp.—Linearis, angustus, postice vix attenuatus, niger fere opacus; rostro medio annulo lato, collo, gulaque sanguineis; antennis articulis 8-11 flavescentibus; thorace antice gradatim attenuato, suprá sanguineo, aureo-sericeo, disco macula nigra; elytris basi thorace vix latioribus, apice oblique et obtuse truncatis, suprá creberrime punctulatis.

Long. 4¼ lin. ♀.

Chontalia, nov. gen.

Sub-fam. *Lepturinæ*. Gen. *Ophistomis* affinis. Corpus breve, latum, minus convexum. Caput antice rostriforme, postice in collo subito constrictum; post oculos tuberculatum. Mandibulæ labrum haud longiores. Labrum latum. Antennæ in sinu oculorum sitæ, filiformes, nec serratæ, corpore (♀) multo breviores; systema porifera nulla. Thorax campanuliformis. Elytra apice late rotundata. Pedes modice elongati. Abdomen (♀) apice late truncatum, haud foveatum.

The pretty *Leptura*-form constituting the type of this genus, differs totally from *Ophistomis* and *Euryptera* in facies and colours; its blue and yellow clothing, in fact, resembles that of the genera *Dorcasomus* and *Desmocerus*. The antennæ are inserted within the anterior margin of the notch of the eyes.

Chontalia cyanicollis, n. sp.—Curta, elongato-oblonga, supra dense subtiliter pubescens, cyanea nitida, elytris dimidio basali flavo-testaceis; palpis flavo-testaceis; capite viridescenti, omnino punctulato; antennis nigris; thorace punctato, angulis posticis longe productis, acutis; scutello nigro; elytris oblongis, postice paululum latioribus, æqualiter leviter convexis, punctulatis.

Long. 5 lin. ♀.

One example, in Mr. Belt's collection.

Odontocera ægrota, n. sp.—Angusta, gracilis, melleoflava, vix nitida, antennis, tibiis omnibus apice, femori-

* Species sent by Mr. Belt since the preceding paper was read.

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busque anticis et intermediis apice nigris; capite grosse, rugose punctato; antennæ (♀) apicem versus incrassatis leviter serratis; thorace anguste cylindrico, crebre grosse foveato; elytris corpore paulo brevioribus, postice angustis parallelis, apice late obtuse truncatis, supra omnino grosse punctatis.

Long. 3½ lin. ♀.

Resembles an *Agaone*, but the abdomen, distinctly constricted at the base (although ♀), shows that it belongs to the genus *Odontocera*.

Stenosphenus ebeninus, n. sp.—*St. trispinoso* proxime affinis. Valde angustatus, toto niger nitidus, sparsissime et brevissime setosus; capite et thorace sparsim punctulatis; elytris apice utrinque trispinosis, supra punctis setiferis in lineis 5 vel 6 seriatis, interstitiis punctulatis.

Long. 5¼ lin. ♂.

The whole body is much narrower, and the punctuation of the elytra much finer than in *St. trispinosus*.

Metaleptus binoculus, Bates, *ante* p. 193.—Recently found by Mr. Belt in Chontales.

Dendrobias maxillosus, Serville, Ann. Soc. Ent. Fr. 1834, p. 44.—A specimen sent home by Mr. Belt is much larger than the insect described by Serville; viz., 12 lin. instead of 9 lin.

Lissonotus flavocinctus, Dup. Mag. de Zool., 1836, pl. 143, f. 2.—Found also in New Granada.

Adetus muticus (*Agennopsis mutica*, Thoms. Arch. Ent. I. p. 302).—Generally distributed throughout Tropical America. I can detect no important difference between specimens from Chontales, the Amazons, and Rio Janeiro. *Adetus analis*, Leconte, = *Polyopsia analis*, Haldem., which is stated by Leconte to be a South American insect, may possibly be this species. *Agennopsis mexicana*, Thoms. (Physis II. p. 153) is certainly the same.

Tautoclines binotata, Thoms. Physis, II. p. 155.—Also found in Mexico.

Eupogonius subæneus.—Parvus, angustus, subcylindricus, griseo-fuscus, pallide æneo-tinctus, subnitidus, pilis

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longis griseis dense vestitus; capite grosse sparsim punctato; antennis articulis 1-4 griseo-pilosis, 5-11 brevius fusco-pilosis, 3-4 longitudine cæteribus sequentibus æqualibus; thorace cylindrico, medio utrinque acute tuberculato, supra inæquali, grosse sparsim punctato; elytris apice obtuse rotundatis, supra grosse sublineatim punctatis, versus apicem lævioribus, ibique subrufescentibus.

Long. 2⅓-2½ lin.

Three examples.

Eupogonius flavocinctus.—Subcylindricus, castaneo-fuscus, subnitidus, pilis erectis dense vestitus; capite et thorace vittis tribus, elytris margine, sutura, vittaque mediana ante apicem ad suturam curvata, ochraceis; capite crebre grosse punctato; antennis filiformibus, pube brevi concolori dense vestitis, et præterea longe pilosis; thorace subcylindrico, medio utrinque leviter angulato, vix tuberculato, crebre punctato; scutello ochraceo; elytris sublineatim (prope basin grossius) punctatis; corpore subtus griseo-pubescenti, sternis crebre punctatis.

Long. 2½ lin.

In colours resembling *Esmia turbata*, but wanting the contracted vertex and trapeziform forehead, which renders that species generically distinct from *Eupogonius*.

Eupogonius ursulus, n. sp.—Major, robustus, olivaceo-fuscus, lanuginosus et passim erecte pilosus; thorace medio utrinque tuberculo valido; antennis robustis, corpore paulo longioribus, articulo 3io quam 4to multo longiori, 5-11 multo brevioribus, basi angustatis; elytris sparsim subtiliter punctulatis; fronte inter antennas plana.

Long. 4½ lin.

The three species here described would, according to the method pursued by Thomson and Lacordaire, form as many new genera.

Amphicnœia crustulata, n. sp.—Angusta, cylindrica, sparsim setosa, nigro-fusca, pubescens, occipite thoraceque macula laterali rufa; supra crebre (elytris sublineatim) punctata; pedibus rufo-piceis.

Long. 2¼ lin.

Three examples; the large red lateral spot of head and thorax is of a rich rosy colour in fresh examples.

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Polyrhaphis angustatus, Buquet, Ann. Soc. Ent. Fr. 1853, p. 444.—Also Cayenne and Amazons.

Steirastoma melanogenys, White, Cat. Long. Col. Brit. Mus. II. p. 355.—Also Cayenne and Amazons.

Alcidion privatum, Pascoe, Trans. Ent. Soc. ser. 3, vol. V. p. 283.—Also at Sta. Martha, New Granada.

Leptostylus cretatellus, Bates, Ann. Mag. N. H., August, 1863.—Also Amazons.

Anisopodus hamaticollis, n. sp.—Magnus, depressus, ochraceo-griseus, fusco-varius; thorace utrinque juxta spinam producto, convexo, spina ipsa valde hamata; elytris trigonis, punctatis, fuscis, ochraceo variegatis et lineis obscuris canis; apice valde oblique sinuato-truncatis, supra carina basali et costulis tribus discoidalibus lævibus obtusis: tibiis anticis valde curvatis, intus apice in spinam obtusam productis; femoribus posticis longissimis, gradatim clavatis; antennis fuscis.

Long. 6 lin. ♂.

Anisopodus scriptipennis, n. sp.—Depressus, minus triangularis; griseus vel ochraceo-griseus, elytris prope apicem utrinque lituris tribus curvatis, fascia basali, guttisque nonnullis in lineas tribus ordinatis, fuscis; antennis rufo-testaceis, articulis apice fuscis; thorace plagiatim punctulato; disco vittulis duabus fuscis, spina laterali acuta, obliqua, recta; elytris apice fortiter oblique sinuato-truncatis, angulis productis acutis, epipleuris verticalibus, carina centro-basali nulla, punctulatis; pedibus pallide testaceis, femoribus, tibiis et tarsis, apice fuscis; femoribus posticis (♂) modice elongatis, subabrupte clavatis (♀), haud apicem elytrorum superantibus, minus clavatis: tibiis anticis intus curvatis, apice (♂) productis.

Long. 3½ lin.

Anisopodus pusillus, Bates, Ann. Mag. N. H., October, 1863.—Also Amazons.

Lepturges musculus, Bates, Ann. Mag. N. H., November, 1863.—Also Amazons.

Lepturges festivus, n. sp.—Elongato-ellipticus, ochraceo-griseus, subtiliter pubescens; capite postice, thoracis disco, maculaque elytrorum humerali, flavo-aurantiacis;

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thorace lateribus plagis duabus nigro-fuscis, spina acutissima paulo ante basin sita; scutello nigro; elytris apice oblique sinuato-truncatis, angulis haud productis, supra utrinque maculis 5 et sutura medio, nigris (macula prope basin parva altera prope apicem majori rotundis, 2-3 lateralibus elongatis) macula humerali aurantiaca; antennis nigris, articulo 4 dimidio basali flavo: pedibus nigris, femoribus basi coxisque flavo-testaceis.

Long. 2¾ lin. ♀.

♀. Segmentum ultimum dorsale medio in spinam obtusam productum.

Lepturges unilineatus, n. sp.—*L. roseicolli* coloribus similis, at differt elytris medio griseo-lineatis, haud flavo-cinctis. Elongato-ovatus, vel (♂) sublinearis, fusco-niger, tenuiter griseo-pubescens, capite et thorace rufis, illo plus minusve nigro-varius; elytris apice rotundatis, supra omnino punctatis, vitta angusta mediana cinereo-grisea, ante apicem ad suturam curvata et terminata; thorace transverso, lateribus fulvo-tomentoso, spina laterali elongata, obliqua, procul a basi sita, ipso basi valde constricto: femoribus fortiter clavatis, basi rufo-testaceis.

Long. 2-2½ lin. ♂ ♀.

The ♂ is larger and more linear than the ♀, and the hind thighs much longer and thicker: there is no sexual difference in the terminal abdominal segment.

Lepturges lætificus, n. sp.—*L. venusto* proxime affinis. Elongatus, ochraceus, subtilissime tomentosus, vittis thoracis 4 dorsalibus, maculisque elytrorum elongatis utrinque 7, nigro-fuscis; fronte et vertice fusco-nebulosis; thorace ante basin utrinque tumidulo, haud spinoso et postice paululum angustato; scutello fusco; elytris apice transversim sinuato-truncatis, angulis productis, exteriori elongata, acuta, maculis elongatis fuscis 2: 3: 2 ordinatis, 2 apicalibus conjunctis, 2 interioribus vittula subsuturali formantibus; femoribus flavo-testaceis, apice, tibiis, tarsisque fusco-nigris: antennis nigris.

Long. 3¼ lin. ♂.

Cosmotoma rubella, Bates, Ann. Mag. N. H., February, 1864.—One example, in Mr. Belt's collection, rather darker in colour of the elytra than specimens from the Amazons.

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Trypanidius geminus, Pascoe, Tr. Ent. Soc. ser. 2, V. p. 29.—Hitherto recorded only as found at Cayenne. The Chontales example differs in the two velvety spots of each elytron being united into one.

Carneades princeps, n. sp.—Modice elongata, castaneo-nigra, tomento subtilissimo vestita, vitta dorsali thoracis et verticis, plaga irregulari elytrorum post-scutellari, fascia maculari et interrupta pone medium, alteraque prope apicem, cretaceo-ochraceis; antennis (♀) corpore brevioribus, castaneo-rufis, articulis 1, 3, 4 apice, 5, 7, 9, 11 toto nigris, 4, 6, 8, 10 albo-griseo annulatis; genis et sternis lateraliter plagis vel vittis magnis cretaceo-ochraceis; abdomine segmentis 2, 3, 5 maculis lateralibus ejusdem coloris; pedibus castaneo-rufis, coxis, tibiis apice et tarsis nigris; tibiis medio, tarsisque articulo 1 et 2 (partim) albo-griseis; elytris punctis asperis nonnullis lineatim digestis versus basin, humeris valde prominentibus, antice fortiter carinatis.

Long. 7 lin. ♀.

One example only of this remarkable and handsome species.

Carterica cincticornis, Bates, Ann. Mag. N. H., March, 1865.—Also Amazons.

Callia fulvocincta, Bates, Ann. Mag. N. H., April, 1866.—Mexico; Amazons; Chontales.

Callia minuta, n. sp.—Parva, Gen. *Octogonotes*, Fam. *Halticidarum*, similis, nigra, setosa, subtus griseo-argenteo tomentosa; supra capite, thorace, dimidioque basali elytrorum, rufo-fulvis: elytris regulariter striato-punctatis; antennis robustis filiformibus, nigris; pedibus piceis, anticis basi pallidis.

Long. 2 lin.

The black colour of the apical part of the elytra advances a little on the suture. The species resembles much the genus *Octogonotes*, and is evidently mimetic, like its congeners *C. criocerina, halticoïdes*, etc.

NOTE.—The number of Longicorn Coleoptera found in Chontales is increased, by the preceding *Addenda*, and by a few doubtful forms still remaining unnamed, to about 280 species. As will be remarked, the proportion of species peculiar to the district, and the relations of the fauna, are not materially altered by the Addenda.

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X. *Descriptions of Twenty new species of* Buprestidæ. By Edward Saunders, F.L.S., V.-P. Ent. Soc.

[Read 6th May, 1872.]

The following are characters of twenty new species of *Buprestidæ*, belonging to various genera of that family. I feel that a string of descriptions of unallied species is always unsatisfactory; but I have endeavoured to make it as useful as possible, by stating the known species to which each of those herein described is allied, and also by giving the distinguishing characters, where the species are closely related to each other.

The new species are:—

Amblysterna subvittata . .	Zambesi.
Chrysochroa Brownii . .	Ceylon.
„ *punctatissima* .	East Indies.
Philochteanus igneiceps . .	Burmah.
Chrysaspis auricauda . .	Cape Palmas.
Steraspis Welwitschii . .	Loando.
Cyria elateroides . . .	Swan River.
Chalcotænia Ajax . . .	Queensland.
„ *quadrisignata* .	„
„ *superba* . .	Nicol Bay.
„ *Martinii* . .	N. W. Australia.
„ *australasiæ* . .	„
Paracupta tibialis . . .	Fiji Islands.
Halecia maculicollis . .	Brazil.
Conognatha Badenii . .	Nov. Fribourg.
„ *Rogersii* . .	Minas Geraes.
„ *paranaensis* . .	Parana.
Stigmodera rubricauda . .	Queensland.
„ *unicincta* . .	Adelaide.
„ *Duboulayi* . .	Nicol Bay.

Amblysterna subvittata, n. sp.

Convexa, ænea, capite rugoso-punctato, medio carinato. Thorace fortiter punctato, basi lobato. Elytris rugose et

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irregulariter punctatis, utrinque prope suturam maculis septem albido-sericeis ornatis in forma vittæ disponendis, et in marginibus lateralibus maculis 10-12 notatis. Subtus rugoso-punctata, albido-sericea.

Bronzy. Elytra with seven spots on each, near the suture, and about ten or twelve on each lateral margin, and the underside covered with gray sericeous pubescence.

Head rugosely punctured, carinated down the centre. Thorax with the anterior margin much rounded, sides slightly compressed, base deeply bisinuate; disc very convex, closely and somewhat rugosely punctured. Elytra rugosely and irregularly punctured, considerably wider than the thorax at their base, sides gradually converging to the apices, each of which has three teeth, two very small and close together, at the suture, and one some little way up the lateral margin. Beneath, legs, and antennæ rugosely punctured, the former covered with sericeous gray pubescence.

Length 8½ lin.; breadth 4 lin.

Hab.—Zambesi.

Should follow *vittipennis*, Bohem., from which it differs in its longer and more compressed thorax, the wide irregular band on its elytra, and by the small lateral spots, &c.

Chrysochroa Brownii, n. sp.

Viridi splendens. Capite inter oculos excavato, rugoso. Thorace fortiter punctato, linea dorsali et postice subcuprea. Elytris punctatis, utrinque lineis quatuor subelevatis, et vitta lata subcuprea ornatis, apicibus unidentatis. Subtus, cupreo-viridis, subpunctata. Antennis pedibusque cupreis.

Head green. Thorax green in front, especially at the angles, with the dorsal line and the base somewhat coppery. Elytra green, with the disc of each widely coppery. Beneath golden-green. Antennæ and legs cupreous.

Head punctured, with a raised line on the vertex, excavated between the eyes, and rugose. Thorax deeply punctured, rugosely on the sides, anterior margin somewhat raised and smooth, sides rounded, base smooth, with a shallow median lobe. Elytra much wider at the shoulders than the thorax, sides gradually rounded, apex of each unidentate, surface punctured, each elytron with

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four slightly raised lines. Beneath, with a few scattered punctures down the middle, sides covered with very short gray hairs.

Length 16 lin.; breadth 3½ lin.

Hab.—Ceylon.

Should follow *mutabilis*, Oliv., from the var. *marginata*, L. & G., of which it differs in the long trapezoidal thorax without impressions, the general colour, and the absence of the coppery margins to the elytra. I have named the above in honour of Mr. Edwin Brown, who very kindly presented me with the specimen described.

Chrysochroa punctatissima, n. sp.

Viridis, confertissime punctata; capite inter oculos rugoso et excavato. Thorace brevi, lateribus subrotundatis, basi lobato, linea dorsali lævi vix elevata. Elytris utrinque lineis duabus subelevatis, apicibus denticulatis, cupreis. Subtus aureo-viridis, punctata, lateribus aureo-sericeis; tarsis aureis; antennis nigris.

Bright green, apex of elytra very narrowly coppery. Beneath, golden-green, tarsi golden, antennæ black.

Head, punctured on the vertex, excavated and rugose between the eyes. Thorax short, anterior margin nearly straight, sides slightly rounded, base with a shallow median lobe. Surface very finely and closely punctured, the punctures becoming confluent on the sides, dorsal line narrow, smooth, and slightly raised. Elytra much wider than the thorax at the shoulders, very finely, regularly, and closely punctured, the punctures less distinct and further apart about the region of the scutellum; sides gradually rounded, apex denticulate; on each elytron below the middle two faintly marked raised lines may be observed. Beneath, and legs, punctured; sides covered with golden sericeous pubescence.

Length 17½ lin.; breadth 6 lin.

Hab.—East Indies.

Allied to *ignita*, Linn., after which it should be placed. It differs in its shorter form, more convex thorax, its uniform green upper surface, and its duller appearance, caused by the elytra being punctured closely all over instead of being nearly impunctate at the base, besides minor characters.

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Philochteanus igneiceps, n. sp.

Capite igneo-cupreo, fronte profunde impresso, vertice aureâ, punctatâ. Thorace aureo-viridi, præsertim in lateribus punctato, utrinque impressione rotundato notato, linea dorsali lævi subelevata, margine antice elevato, lateribus rotundatis, basi recta. Elytris viridibus, punctato-striatis, lineis tribus elevatis, lateribus sub humeros sinuatis, apicibus denticulatis. Subtus aureo-cuprea, punctata; prosterno cupreo; pedibus viridibus.

Head, coppery-red, golden on the vertex. Thorax golden-green, elytra green; beneath, coppery-golden, prosternum coppery, legs green.

Head punctured, with a deep narrow slit just below the vertex. Thorax with the anterior margin raised, sides diverging in almost straight lines to about the middle, then subangulate, whence nearly straight to the base; base straight; surface punctured, punctures on the sides confluent; between the punctures may be perceived a much finer punctuation; dorsal line smooth and slightly raised on each side, between it and the lateral margin is an ovate punctured fovea. Elytra punctate-striate, smooth about the region of the scutellum, on each may be perceived three slightly raised lines; sides sinuate and impressed below the shoulders, apex denticulate, terminating in a sharp tooth. Beneath punctured, sides covered with very short silky hairs.

Length 15 lin.; breadth 5 lin.

Hab.—Burmah.

Should be placed in front of *rubro-aureus*, De Geer.

Chrysaspis auricauda, n. sp.

Obscure ænea, capite inter oculos excavato. Thorace marginibus lateralibus reflexis, aureo-viridibus; disco punctato, linea dorsali sublævi, lateribus subrugosis. Elytris rugoso-punctatis, striatis, lateribus prope humeris bi-angulatis, viridibus; apice late aureo, denticulato. Subtus aurea, punctata; tibiis tarsisque viridibus.

Head and thorax dull bronzy black, the latter with the reflexed lateral margins green. Elytra bronzy, punctures green; sides behind the shoulders green, apex widely

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golden, the colour extending some distance up the suture and the sides. Beneath golden; tibiæ and tarsi of the front two pairs of legs, and tarsi only of the last, green.

Head, excavated between the eyes, punctured, with a very narrow deeply impressed line down the middle. Thorax, anterior margin raised, nearly straight, its angles much depressed, lateral margins reflexed, somewhat rounded, base slightly bisinuate, surface punctured, the punctures larger and confluent on the sides; dorsal line smooth, disc flat, raised in a triangular form. Elytra widest at the shoulders, largely and irregularly punctate-striate, the punctures finer near the apex, lateral margins reflexed, with two well-marked angles on each below the shoulder, then gradually converging to the apex, which is denticulate. Beneath, punctured, sides covered with short golden hairs.

Length 18 lin.; breadth 6 lin.

Hab.—Cape Palmas.

Should follow *viridipennis*, Saund.

Steraspis Welwitschii, n. sp.

Caput inter oculos excavatum, rugose punctatum. Thorax rugose punctatus, fusco-cupreus, lateribus antice viridibus, margine anteriore elevatâ lateribus rotundatis. Elytra regulariter punctato-striata, utrinque vitta lata cupreâ ornata, sutura, base, marginibusque viridibus. Subtus cuprea, albido-pubescens.

Head dull green, with coppery-brown reflections. Thorax coppery on the disc, green on the anterior margin, and on the sides in front. Elytra coppery; base, suture, and sides green; beneath coppery.

Head excavated between the eyes, and rugosely punctured. Thorax with the anterior margin raised, sides rounded, slightly raised and smooth, base shallowly and triangularly lobed; surface irregularly punctured, the punctures confluent at the sides so as to make them rugose; dorsal line indicated by a triangular smooth space on the base and the anterior margin. Elytra regularly and closely punctured in lines, the interstices at the sides and apex also very finely and closely punctured; sides with two angles near the shoulder, the lower

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one the more prominent, sinuate between them, gradually rounded to the apex, which is denticulated. Beneath, and legs, punctured; punctuation on the sides of the abdomen very fine, these are also covered with a fine white pubescence; prosternum smooth in the centre, largely punctured on the sides.

Length 20 lin.; breadth 7 lin.

Hab.—Loando.

Captured by Dr. Welwitsch, to whom I have pleasure in dedicating it.

Cyria elateroides, n. sp.

Nigra, nitida, capite fortiter punctato-lanuginoso, vertice inter oculos, canaliculato breviter carinato. Thorace fortiter punctato, lateribus flavis, utrinque bi-impressis, basi lobato, supra scutellum foveolato. Elytris punctato-striatis, lateribus vittaque abbreviata flavis, apicibus unidentatis. Subtus albo-pubescens.

Black, sides of the thorax and of the elytra, and a vitta on each of the latter, extending from the shoulder to about three-quarters of their entire length, gradually narrowing towards the apex, flavous.

Head punctured, with a narrow furrow on the vertex, and a short carina between the eyes. Thorax elongate, anterior margin raised, produced in the middle; apex widely truncate, sides rounded, posterior angles acute, base bisinuate; surface largely and deeply punctured with a smooth dorsal line; near each margin are two foveæ, a very small round one close to the posterior angle, and a larger oval one above it; there is also a small round impression above the scutellum. Elytra twice and a-quarter as long as wide, remotely punctured, and punctate-striate; sides sinuate below the shoulders, apex of each terminating in a sharp point. Beneath and legs punctured, covered with gray hairs.

Length 9 lin.; breadth 3 lin.

Hab.—Swan River.

In colour, resembling *vittigera*, Hope, but very different in shape and the style of the markings; should follow that species.

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Chalcotænia Ajax, n. sp. Pl. VI. fig. 8.

Viridis, capite inter oculos impresso, rugoso. Thorace rugoso, margine anteriore in medio et in angulis producta, lateribus ante medium angulatis deinde subrectis ad angulos, base recta. Elytris striatis, interstitiis subrugosis, lateribus sub humeros sinuatis, postice denticulatis, utrinque duabus foveis rotundatis, lineaque impressa prope apicem pubescente subflavo repletis. Subtus rugosa, flavo-varia.

Green, raised portions subcyaneous. Elytra with two round spots on each, and an elongate impression near the apex, filled with yellowish pubescence. Beneath, between the rugosities, yellow, pubescent. Antennæ dark brown.

Head rugose, impressed between the eyes. Thorax with the anterior margin roundly produced in the middle, and at the angles; sides angulate above the middle, then almost straight to the base, which is straight; surface punctured, covered with irregular rugosities, near each posterior angle is a somewhat indefinite fovea. Elytra deeply striated, striæ somewhat irregular and rugose at the sides; on each elytron there are two round foveæ, one above, the other below the middle, and an impressed line subparallel to the margin near the apex; sides sinuate below the shoulders, posteriorly denticulate, denticulations very fine at the apex. Beneath and legs punctured, rugose, especially at the sides.

Length 21 lin.; breadth 6 lin.

Hab.—Queensland.

Should precede *quadrisignata*.

Chalcotænia quadrisignata, n. sp. Pl. VI. fig. 4.

Capite thoraceque viridibus, flavo-variis, hoc rugoso, lineâ dorsali elevata; elytris viridi-cyaneis, rugosis, utrinque foveis duabus maculaque elongata laterali, flavo pubescentibus. Subtus rugosa, flavo-varia.

Head and thorax bright green, the rugosities cyaneous, the depressed portions pubescent and yellow. Elytra dull cyaneous, punctures green, two round foveæ on each, and an elongate impression on each posterior margin, filled with yellow pubescence. Beneath and legs variegated with yellow pubescence. Antennæ, first joint bright green, the rest dull brown.

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Head rugose, channelled between the eyes. Thorax slightly produced in the middle, and at the angles of the anterior margin, which is a little more than half as wide as the base; sides rounded, base nearly straight; surface rugose, especially at the sides, dorsal line wide, and slightly but irregularly raised. Elytra wider than the thorax, lateral margin below the shoulder with a sharp angle, thence almost straight to about the middle, from which it gradually curves to the apex, which is sharply pointed, posterior margin denticulate; surface finely rugose, the rugosities appearing to be arranged in lines; a slight depression at the base, a large round fovea on the disc above the middle, a smaller one midway between it and the apex, and a longitudinal impressed streak on the posterior margin, pubescent and yellow. Beneath rugose, the impressed portions covered with yellow pubescence; legs punctured.

Length 11 lin.; breadth 5 lin.

Hab.—Queensland.

Should follow *Ajax*, Saund.

Chalcotænia superba, n. sp. Pl. VI. fig. 2.

Viridis capite excavato. Thorace irregulariter punctato linea dorsali triangulariter elevatâ. Elytris minutissime punctatis, costis quatuor lævibus, cyaneis; lateribus post medium rotundatis, postice denticulatis. Subtus rugosa, antennis subnigris.

Bright green; rugosities of the thorax and the raised lines of the elytra cyaneous; antennæ pale brown; head with two elevated lines between the eyes, joined at the posterior margin, rugose and excavated between them. Thorax; anterior margin emarginate, sides slightly rounded in front, thence almost straight to the base, which is nearly twice as wide as the anterior margin and straight; surface finely punctured with numerous smooth irregular elevations, disc with a raised, smooth, somewhat triangular dorsal line, wide at the base, where it is met by a round puncture. Scutellum, very small, nearly square. Elytra much wider at the shoulders than the thorax, very slightly sinuate above the middle, thence gradually rounded to the apex, which is simply pointed, posterior margin finely denticulate; surface very finely punctured; suture and four curved lines on each elytron,

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raised and smooth, of these the second is the longest, almost touching the apex, the third is very short, and unites with the fourth near the shoulder. Beneath punctured, rugose at the apex of each abdominal segment; legs punctured.

Length 18 lin.; breadth 7½ lin.

This species should follow *gigas*, Hope, from which its greater width, and the different character of the rugosities of the thorax, the wide dorsal line, &c., easily distinguish it.

Hab.—Nicol Bay, W. Australia.

Chalcotænia Martinii, n. sp.

Aureo-viridis. Thorace sparse punctato, lateribus rugosis, lineâ dorsali postice impressâ, antice elevatâ. Elytris punctatis, sutura, lineisque quatuor, lævibus, cyaneis, secundâ interruptâ; lateribus postice denticulatis. Subtus subrugosa; pedibus punctatis, capillis cinereis obsita.

Golden green, raised portions of the thorax and elytra cyaneous. Antennæ testaceous, first joint coppery.

Head punctured, with a somewhat circular impression between the eyes, which is furrowed down the middle. Thorax with the anterior margin nearly straight, sides and base slightly rounded, posterior angles acute; surface smooth on the disc, with remote punctures, rugose and depressed at the sides and posterior angles; dorsal line impressed, except in front, where it is slightly raised. Elytra slightly wider than the thorax: sides sinuate above the middle, rounded and denticulate posteriorly; surface closely punctured, each elytron with the suture and four raised lines smooth, of these the second and third are abbreviated, the third being the shortest, and the second being interrupted about a third of the entire length of the elytra from the base; this last character will probably be variable. Beneath and legs punctured, in some places rugosely, and covered with very short silvery hairs.

Length 12 lin.; breadth 4 lin.

Hab.—N. W. Australia.

This species should precede *gigas*, Hope.

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Chalcotænia australasiæ, n. sp. Pl. VI. fig. 6.

Viridis, capite excavato. Thorace punctato, lateribus impressis, rugosis, flavo-tomentosis. Elytris costatis, costis apiceque cyaneis, interstitiis impressionibus duabusque discalibus flavo-tomentosis. Subtus ruguso-punctata.

Green; raised portions of thorax and elytra, and the apex of the latter cyaneous, depressions filled with a yellow powdery pubescence.

Head deeply excavated between the eyes and rugosely punctured. Thorax with the anterior margin nearly straight, sides rounded in front, nearly straight and subparallel behind; base with a wide, slightly rounded, central lobe; surface rugosely punctured, dorsal line impressed; sides each with an oblong rugose impression, extending from the base to the anterior angles, filled with yellow pubescence. Elytra wider than the thorax, sides slightly sinuate above the middle, sharply and finely denticulate posteriorly. Surface rugosely punctured, each elytron with the suture, and four lines considerably raised, between these, near the base, are narrower raised lines, which are very irregular and abbreviated. There are two irregular impressions on each elytron, one of a somewhat triangular shape above the middle, the other narrow and transverse, midway between it and the apex. These impressions and the spaces between the costæ are filled with yellow pubescence. Beneath and legs rugosely punctured, covered with yellow pubescence.

Length 11 lin.; breadth 4 lin.

Hab.—N. W. Australia.

Should follow *superba*, Hope.

Paracupta tibialis, n. sp.

Caput aureum, transverse rugosum, lineâ dorsali foveâque utrinque impressum. Thorax viridis, aureo-micans. Elytra viridia, lateribus læte cupreis; punctato-striato, marginibus postice denticulatis. Subtus aureo-viridis, punctata; femoribus viridibus; tibiis basis viridibus, apicibus flavis; tarsis antennisque flavis.

Head golden. Thorax green, the sides with golden reflections. Elytra green, with a wide band on

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each margin golden-coppery. Beneath golden green; abdominal segments each with two round lateral foveæ, filled with yellow pubescence. Femora green; tibiæ green at their base; apices of these, tarsi and antennæ flavous, claws golden-coppery.

Head rugose, channelled in front. Thorax transversely rugose; anterior margin emarginate, sides nearly straight, posterior angles acute, base rounded, dorsal line impressed, sides with a rugose fovea on each near the hind angles. Elytra wider than the thorax, deeply punctate-striate, sides sinuate below the shoulders, thence attenuated to the apex, posteriorly deeply denticulate. Beneath and legs punctured, sides of the abdominal segments foveated and pubescent.

Length 13 lin.; breadth 5 lin.

Hab.—Owahan Island, Fiji.

Should follow *Louisa*, White, to which it bears some superficial resemblance.

Halecia maculicollis, n. sp.

Viridis. Capite inter oculos impresso-punctato. Thorace punctato, margine anteriori subrectâ, lateribus post medium productis et rotundatis, angulis posticis subrectis base bisinuatâ, disco maculis duabus cyaneis lævibus ornato, lineâ dorsali impressâ, lateribus etiam utrinque maculis duabus rotundatis, lævibus, notatis. Elytris vermiculato-rugosis, apice attenuata, marginibus posticis denticulatis. Subtus punctata, viridi-cuprea; pedibus igneo-nitentibus.

Green. Thorax with three round spots on each side, viz.: one on the disc, and two on each lateral margin, cyaneous. Elytra with its raised portions cyaneous. Beneath coppery-green; tarsi fiery copper-colour.

Head punctured, impressed between the eyes. Thorax punctured; anterior margin slightly produced in the middle and at the angles, sides produced in a rounded lobe below the middle, posterior angles almost right angles; base with a shallow rounded median lobe, dorsal line impressed; the cyaneous spots on the thorax are marked with only a few large scattered punctures. Elytra longitudinally vermiculate, sides sinuate below the shoulders, posterior margins denticulate, apex attenuated, extreme tip rounded. Beneath and legs punctured.

Length 12 lin.; breadth 5 lin.

Hab.—Brazils.

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Conognatha Badenii, n. sp. Pl. VI. fig. 1.

Capite thoraceque cyaneo-nigris, punctatis. Elytris pallido-flavis, maculâ reniforme sub scutellum, duabus rotundatis humeralibus, fasciâ latâ post medium, apiceque cyaneo-nigris; lateribus postice denticulatis. Subtus cyaneo-nigra, punctata.

Head and thorax cyaneous-black. Scutellum cyaneous. Elytra yellowish-white, a somewhat heart-shaped spot on the suture below the scutellum, a round one behind each shoulder, a broad fascia behind the middle, and the apex cyaneous-black. Beneath cyaneous.

Head punctured, crown with an impressed line. Thorax; anterior margin slightly produced, sides rounded until just above the posterior angles which are produced and rounded, base nearly straight; surface punctured, dorsal line in front, a small round fovea above the scutellum, and one at each posterior angle, slightly impressed. Elytra very finely punctate-striate, once and three-quarters as long as wide, sides subparallel, margin somewhat reflexed and denticulate posteriorly, apex of each emarginate. Beneath, legs and antennæ punctured.

Length 10½ lin.; breadth 4½ lin.

Hab.—Nov. Fribourg; kindly given me by Dr. Baden of Altona, after whom I have pleasure in naming it.

Should precede *patricia*, Klug.

Conognatha Rogersii, n. sp. Pl. VI. fig 9.

Caput thoraxque ænei punctati, hic medio et in augulis posticis impressus. Elytra punctato-striata, testacea, maculis tribus prope basin duabusque subapicalibus æneis; lateribus postice denticulatis. Subtus ænea, cinereo-pubescens.

Head, thorax and scutellum æneous. Elytra testaceous, with an elongate sutural spot below the scutellum, a round one below each shoulder, and a somewhat triangular one on each, some way above the apex, æneous. Beneath æneous.

Head strongly punctured. Thorax with the anterior margin raised and produced; sides slightly rounded, base lobed in the middle; surface deeply punctured, disc widely depressed posteriorly, the hinder angles foveated.

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Elytra punctate-striate, sides sinuate below the shoulders, denticulate posteriorly, apex of each bispinose. Beneath finely punctured, sides covered with longish gray pubescence.

Length 10½ lin.; breadth 4 lin.

Hab.—Minas Geraes, Brazil; captured by Mr. Rogers.

Should precede *paranaensis*, Saund.

Conognatha paranaensis, n. sp. Pl. VI. fig. 3.

Caput cyaneum, punctatum. Thorax cyaneo-niger, punctatus; lateribus rectis, in angulis posterioribus foveatis. Elytra testacea, punctato-striata, suturâ post scutellum marginibus post humeros, fasciis duabus latis post medium, apiceque, cyaneo-nigris, lateribus postice denticulatis. Subtus cyanea; abdominis segmentis tribus posticis testaceis.

Head cyaneous. Thorax cyaneous-black. Elytra testaceous, with the suture for a third of their entire length from the base, the lateral margins from behind the shoulders, two wide flexuous bands behind the middle, and the apex, cyaneous-black. Beneath, legs, and antennæ cyaneous, three apical segments of abdomen testaceous.

Head deeply punctured, impressed above the mouth, the punctures smaller and closer together down the middle. Thorax: anterior margin raised and slightly produced, sides straight, posterior angles acute, base with a rounded median lobe; surface punctured, dorsal line indicated by two slight punctured impressions above the scutellum, and a small raised smooth space on the anterior margin; posterior angles foveated and punctured. Elytra punctate-striate, sides sinuate above the middle, posteriorly denticulate, apex of each elytron bidentate. Beneath and legs punctured, with a few scattered grayish hairs.

Length 10½ lin.; breadth 4 lin.

Hab.—Parana.

This species should precede *posticalis*, Saund. I have a second specimen scarcely more than half the size of the one described.

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Stigmodera rubricauda, n. sp.

Capite nigro, punctato, hirsuto, inter oculos impresso. Thorace nigro, punctato, convexo, lateribus rotundatis, linea dorsali lævi. Elytris punctato-striatis, flavis, postice sanguineis, base extrema, apice, suturaque post medium, nigris. Subtus viridi-ænea; abdomine flavo, punctato.

Head, thorax and scutellum black. Elytra testaceous, sanguineous about the apex, which itself is narrowly black, this colour extending along the suture to beyond the middle. The base also is narrowly margined with black. Beneath of thorax, breast and legs, bronzy-green; abdomen flavous.

Head covered with rather long recurved hairs, punctured, impressed between the eyes. Thorax with the anterior margin slightly raised and produced in the middle, sides rounded, base widely and shallowly lobed, very deeply sinuate near each angle. Surface largely and deeply punctured, disc with a somewhat raised smooth dorsal line; there is a very small round fovea just above each of the basal sinuations. Elytra punctate-striate, twice as long as wide, sides subparallel till beyond the middle, rounded posteriorly to the apex, which is bluntly pointed. Beneath and legs punctured.

Length 9 lin.; breadth 3¼ lin.

Hab.—Queensland.

Should precede *Yarrellii*, L. & G.

Stigmodera unicincta, n. sp. Pl. VI. fig. 7.

Caput viride, hirsutum, inter oculos impressum, punctatum. Thorax viridis, punctatus, convexus, margine anteriore elevatâ, lateribus rotundatis late flavis, base subrectâ lineâ dorsali impressâ. Elytra punctato-striata flava, fasciâ post medium apiceque cyaneis; lateribus sub humeros sinuatis, apicibus rotundatis. Subtus cyaneo-viridis, punctata; abdominis apice flavâ.

Head and thorax green, the latter with the sides widely flavous, especially at the base. Elytra flavous, with their extreme base, a rather narrow band behind the middle, and the apex, cyaneous. The colour of the apex joins the band along the lateral margin. Beneath,

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legs, and antennæ greenish blue, the last segment of the abdomen entirely, the two next, with the exception of their hinder margins, and a spot on each side of the first, flavous.

Head punctured, impressed between the eyes, covered with recurved grey hairs. Thorax convex, punctured, with an impressed dorsal line; anterior margin raised; sides much rounded, base nearly straight. Elytra punctate-striate, very slightly broader than the thorax; sides sinuate below the shoulders; apex rounded. Beneath and legs punctured, covered with grayish hairs.

Length 8½ lin.; breadth 3¼ lin.

Hab.—Adelaide.

Should follow *Yarrellii*, L. & G.

Stigmodera Duboulayi, n. sp. Pl. VI. fig. 5.

Caput aureo-viride. Thorax roseo-cupreus, nitidus, punctatus; lateribus flavis. Scutellum æneum. Elytra striata-punctata, flava, base viride, fasciâ abbreviatâ sub humeros, fasciâ latâ infra medium, apiceque late cyaneis. Subtus punctata, flava; prosterno pectorisque medio cupreis; pedibus, marginibusque posticis abdominis viridibus.

Head golden green. Thorax rosy copper colour, with a greenish tint in front; sides, from the anterior margin almost to the base flavous. Scutellum bronzy. Elytra flavous, base narrowly dark green, with an abbreviated band on each below the base, much narrowed at the lateral margin, and produced in its upper corner towards the suture, a broad band suddenly widening at the margins below the middle, and the apex widely, cyaneous. Beneath flavous, prosternum and the middle of the breast coppery. Antennæ, legs, a spot on the first abdominal segment, and the posterior margins of the three next, green.

Head elongate, pointed, punctured, with an impressed line on the vertex. Thorax shining, finely punctured; anterior margin produced in the middle and at the angles; sides rounded, base very slightly bisinuate, a little more than twice as broad as the anterior margin; disc with a very faint dorsal line. Elytra finely punctured, regularly

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and deeply striated, a little wider at their base than the thorax; sides sinuate below the shoulders, apex of each widely truncate and bidentate. Beneath and legs punctured; prosternum much rounded, having a swollen appearance.

Length 17 lin.; breadth 7 lin.

Hab.—Nicol Bay, W. Australia.

This lovely species is named after its discoverer, from whom I obtained it, and should follow *Spencii*, L. & G.

Explanation of Plate VI.

Fig. 1. *Conognatha Badenii.*
2. *Chalcotænia superba.*
3. *Conognatha paranaensis.*
4. *Chalcotænia quadrisignata.*
5. *Stigmodera Duboulayi.*
6. *Chalcotænia australasiæ.*
7. *Stigmodera unicincta.*
8. *Chalcotænia Ajax.*
9. *Conognatha Rogersii.*

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XI. *Notes on certain species of* Pericopides, *omitted in a list of species recently read before the Society.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Read 1st April, 1872.]

Mr. Walker having, for the second time, kindly lent me his copy of Dr. Boisduval's 'Lépidoptères envoyés du Guatemala,' I find descriptions of the following eight species, which (in consequence of their being referred to a distinct tribe from his other new species of the same group), I overlooked in my recent list of *Pericopides* (*ante* pp. 52-58) ; it is to be regretted that some of these, like many other species described in the same pamphlet, are referable to previously described forms.

Genus Calepidos, Boisd., Lep. Guat. p. 89 (=*Eucyane*).

1. *C. Celina*, Boisd., *loc. cit.*

Unquestionably identical with *Eucyane Pylotis;* Dr. Boisduval says it is "un peu plus grand que le *Celadon* de Cayenne. Ailes supérieures d'un brun noir, avec une bande blanche, . . commencant un peu au-delà du milieu de la côte et finissant à l'angle interne; frange du sommet blanche; ailes inférieures noires à reflet bleu, avec la frange blanche."

Hab.—Guatemala (Boisd.) Mexico. B. M.

2. *C. Anacharsis*, Boisd., *loc. cit.*

Perhaps a species of *Esthema* ("Ailes noires . . inférieures avec une rangée marginale de petites taches blanches; . . . "), but compared to *Eucyane glauca.*

Hab.—Nicaragua (Boisd.).

Genus Chetone, Boisd. Lep. Guat. p. 89 (=*Pericopis* and (*Phaloë*).

1. *C. Lorzæ*, Boisd., *loc. cit.*, p. 90.

Certainly a species of *Phaloë;* we have a species probably identical with it in the British Museum, from

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Venezuela. It is nearly allied to *P. cruenta*, and was considered a variety of that species in Mr. Walker's catalogue; it is however, considerably smaller, and decidedly different in marking.

Hab.—Guatemala (Boisd.) *id.* (?) Venezuela. B. M.

2. *C. Phœba*, Boisd., *loc. cit.*

There can be little doubt that this is a variety of *Pericopis Isse*, a very variable species, of which the Museum possesses five specimens from Ega, no two being quite alike in colour and marking; the following extract from Dr. Boisduval's description seems conclusive: "Ailes supérieures noires, rayonnées de rouge à leur base avec deux bandes transversales obliques, d'un jaune soufre, . . . Ailes inférieures d'un rouge un peu fauve, avec les nervures et la bordure noires, . . la bordure marquée d'une série de taches d'un rouge fauve. Quelquefois, dans l'un et l'autre sexe, l'extrémité des ailes supérieures offre une rangée de points blanc marginaux."

Hab.—Guatemala (Boisd.). Ega. B. M.

3. *C. Aorsa*, Boisd., *loc. cit.*

Compared to *Pericopis Amphissa* (? Hübn. Zutr. ex. Schmett. figs. 753-4) = *P. subguttata* of Walker; and probably identical with *Pericopis bivittata;* the description suits admirably.

No locality given.

4. *C. Iscariotes*, Boisd., *loc. cit.*, p. 91.

Said to be of the 'form and appearance of *Neda*, figured by Klug.' I cannot identify it, so in all probability it is a new species.

Hab.—Honduras and Guatemala (Boisd.).

5. *C. Felderi*, Boisd., *loc. cit.*

Seems also to be a new species, of the *P. angulosa* group; it is said to be of the 'form and appearance of the *Salvini* of Felder' (a species at present unpublished).

Hab.—Nicaragua (Boisd.).

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6. *C. Heliconides*, Boisd., *loc. cit.*

Quite unlike any species known to me, but said to have somewhat 'the aspect of *Histrio*.'

My original intention, was to give translations of the descriptions of the preceding eight species;* it has, however, been decided, that the paper will be quite as useful, and more in keeping with my list of *Pericopides*, to which it forms a supplement, if published in the present form.

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* This paper was reported in the Society's Proceedings, under the title —"Translation of descriptions of certain *Pericopides*."

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XII. *Notes on Part III. of the Catalogue of British Insects published by the Entomological Society of London;* Hymenoptera [Chrysididæ, Ichneumonidæ, Braconidæ, *and* Evaniidæ]. By the Rev. T. A. MARSHALL, M.A., F.L.S.

[Read 4th November, 1872.]

THE compiler having willingly complied with the suggestion that no notes should be printed with the Catalogue, desires to make a few remarks upon such points as are not apparent upon the face of the work, and yet ought not to be passed over in silence. The printer's task has been well performed, the revision was executed with every care, and no table of errata is now necessary. With the single exception of p. 112, line 7 from top, centauræ (a misprint for centaureæ), it is believed that no erratum exists of a kind likely to mislead the reader.

With regard to the generic and specific names adopted, and their orthography, very few changes have been ventured upon, and those only of an obvious character, care being always taken to observe the law of priority, and in cases of misspelling to preserve as far as possible the identity of the word corrected. The cataloguer has borne in mind that his function was to register the facts observed by others in their own manner, and not to indulge in any originalities. And he has had cause to congratulate himself upon the general correctness of the received names, which compare very favourably with those of some of the other orders of insects. The following are the chief alterations which have been adopted: p. 1. *Elampus* Spin. is corrected by Förster to *Ellampus;* p. 2. *Omalus* is changed to *Homalus;* p. 19. *Exephanes* to *Exophanes;* p. 41. *Linoceras* Tasch. (1865) is preferred to *Macrobatus* Holmgr. (1854), because the latter overthrows Gravenhorst's original specific name *macrobatus*, and substitutes *clavator* Holmgr.; *Brachycentrus* is discarded for the same reason, and also because it is preoccupied in Neuroptera: for this a new name, *Cyrtocryptus*, was necessary; p. 50. *Trachynotus* is changed to *Nototrachys*, to

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avoid collision with *Trachynotus* Latr. (Règne Anim. v. 14, Tenebrionidæ), both names being of the same date, 1829; p. 63. *Collyria* Schiödte is preferred to *Pachymerus* Gr., the latter being preoccupied in Hemiptera; p. 84. *Acœnitus* is Latreille's own spelling, corrupted by Gravenhorst to *Acœnites*, whom subsequent writers have followed; p. 85. *Ephialtes imperator* and *rex* Kriechb. divide between them *E. manifestator* of the older writers. As it is impossible now to give the name *manifestator* with certainty to either of the above species without introducing a fresh element of confusion, Kriechbaumer's names have been suffered to pass, though his method of discarding so well known a name as the Linnæan *manifestator* cannot be approved; p. 91. *Lissonota* Gr. (1829) too nearly resembles *Lissonotus* Dalm. in Schönh. Synon. Ins. iii. App. (1817), a genus of Longicornia, but as they are not quite identical, the compiler did not think himself at liberty to force in a fresh name; p. 94. *Phytodietus* Gr. is corrected to *Phytodiætus;* p. 100. *Rogas* Nees, to *Rhogas;* and p. 103. *Rhitigaster* Wesm. to *Rhytidogaster*, in accordance with the rules of Greek. This is the place to observe that in the Braconidæ many changes are proposed by Förster in his synopsis of the group (Verh. pr. Rheinl., 1862), some being in their turn liable to fresh objections. He discards *Microdus* Nees on the ground of its being only a collateral form of *Microdon*, a genus of Fishes, and substitutes for it *Eumicrodus* and *Diatmetus*. In the Catalogue, p. 108, the older names *Earinus* and *Therophilus* Wesm. are restored. *Hybrizon*, p. 109, sufficiently indicated by Fallén, takes precedence of the ill-spelt *Paxylomma* of the Enc. Méth.; and *Aspidogonus*, p. 120, is corrected for *Aspigonus*. Some incorrectly formed compounds (*Phænolyta*, *Phænocarpa*, and *Phænolexis*) have been left, as the radical fault of their structure admits of no simple remedy. The occasional slight changes of specific names are either necessitated by the gender of the generic appellation, or they are such plain cases as *pallidipes* for the abortive *pallipes*, *Bassus athaliiperdus* for *athaliæperda*, and so forth. The compiler thinks himself well rid of this trifling part of the subject; but as a Catalogue in Natural History is a thing made up of, or at least wholly dressed in, such shreds and patches, it seems requisite to state to what extent trimming and paring have been resorted to, in order to produce neatness and uni-

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formity of appearance. And this of course is the only excuse for those tiresome and petty operations in which

"A's deposed, and B with pomp restored."

With regard to the arrangement of species, the cataloguer would gladly have placed the typical species of each genus first, and the rest in the order of their affinity to that type. But the imperfect condition of the literature relating to these insects, the absence of definitely constituted types, and the impropriety of setting up any freshly selected according to appearances, forbade the uniform application of this principle. For one reason or another, the adoption of any fixed principle throughout was equally impracticable, except that of alphabetical arrangement. This is so far from being any real system, that it is rather a confession of the utter absence of system, and moreover its adoption in this case would have been retrogression, by losing sight of such partial arrangements as have been here and there already proposed. In this difficulty then the cataloguer has been guided by what he conceived to be the highest principle applicable to each particular case, resorting, where that failed, to the next lower principle, and, as a last resource, betaking himself to alphabetical arrangement. Wherever this may be found to prevail, it must be taken to indicate the impossibility, from want of knowledge, of effecting a more satisfactory arrangement; ex. gr. *Ichneumon*, spp. 109—144, *Tryphon*, *Mesoleptus*, and *Limneria*.

The order of sequence in the synonyms is the same as that adopted in the Catalogue of Neuroptera, and which differs somewhat from that of the Aculeata. The choice of these citations, most numerous and perplexing, presented several difficulties not wholly to be overcome, and only to be mitigated by the exercise of a free discretion. It will be seen that of the mass of references given by Gravenhorst, a considerable number are omitted. They are, as a rule, dubious in different degrees, and their introduction would have greatly increased the size of the Catalogue, while at the same time they diminished its usefulness. The degree of similarity which many years ago was sufficient to satisfy entomologists of the identity of two insects, would not content the more minute observers of the present day. Without attempting then to prescribe for himself any strict rules for action in a matter requiring

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perhaps a different judgment in each case, the cataloguer has aimed at excluding all matter so doubtful as to be useless, and to render the references complete in all cases of certainty. If the line waves more or less, he must shelter himself under the plea that it could not be otherwise. In working out these views, it must occasionally happen that the references do not travel back to the earliest inventor of a now unrecognizable name, but stop short at the first describer of an unmistakeable thing, or in most cases, Gravenhorst, and sometimes not the ancient authorities he quotes. Priority has been a first object or hobby with the compiler, but the hobby has not been ridden to death.

Mr. Walker has remarked, at the end of his "Notes on Chalcidiæ," published in the present year, that "some alterations are required in the arrangement of the families, and the genera and their respective species have yet to be examined in detail." *Pour encourager les autres*, the same judgment, or something very like it, may be pronounced upon the Ichneumonidæ. To descend no further than to the division of genus, the want of an uniform standard is very conspicuous. Some genera are eminently exclusive, and others in the highest degree latitudinarian. The 1,186 species of Ichneumonidæ are comprised in 136 genera; while the Braconidæ, numbering only 439 spp., are distributed among 125 genera, only 11 fewer than those of the tribe preceding them. This disproportion, the result of a totally different idea of Genus in different minds, is mainly due to the labours of Förster, who has established a very great number of generic divisions among the Braconidæ, founded frequently upon minute characters, not involving general appearance and structure, and which to others have seemed only of specific value. We have then at present a mass of very unequal composition, tending both ways into extremes, about half-way between which the truth in other matters is commonly considered to lie. General resemblance and structure (interpreted with a certain moderation) is probably the central point at which these oscillations must cease. Thus, *Enicospilus* and *Ophion* fall conveniently into one genus, *Ophion; Schizoloma*, *Exochilum*, *Heteropelma*, *Anomalon*, *Agrypon* and *Trichomma*, at present only separable with a powerful lens, fall easily into *Anomalon*, and so forth. But these considerations, being beyond the province of a compiler, have not been allowed to appear in the Catalogue.

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So far as it is derived from books, the Catalogue tells its own story, but this is the place for mentioning some other sources from which it has been materially enriched. These sources were, correspondence with the regretted names of Haliday and Desvignes—the collection of the latter, containing a great number of named species not before published as British—inspection of other collections, especially Mr. Walker's, and including many small contributions from different parts of the country—and, lastly, the compiler's own efforts in collecting and determining fresh species. Among the blanks in the British list to which his attention was necessarily called, may be mentioned *Pezomachus*, numbering now 48 species (the difficulty of determining which will be duly estimated by any one who makes the attempt), *Bracon*, *Chelonus*, and other groups not included in Haliday's "Essay on Parasitic Hymenoptera." It would be tedious to particularize all the species introduced for the first time, but a general idea of their numbers may be formed by comparing certain genera with the same in the few previous lists; yet the compiler is well aware that he has only added as it were a stone or two to a heap. New species, generally of small size, are everywhere easily to be discovered by collectors; and more than a hundred, probably undescribed, are still in the writer's hands. Quite recently a remarkable addition to the larger Ophionidæ has become known to Mr. Smith, and will shortly receive due attention. Many additions may be expected to the following genera, among others: *Phygadeuon*, *Hemiteles*, *Limneria*, *Mesochorus*, *Orthocentrus*, *Bracon*, *Aphidius*. *Microgaster*—and especially to *Pezomachus*. None of the peculiarly British forms of this numerous genus appear in Förster's monograph. The species of *Microgaster*, described independently and simultaneously by several writers, are in the same sort of confusion as to their synonyms, as—say, for instance, *Mylabris* in the Coleoptera—though their difficulties are rather owing to art than nature. It is much to be regretted that so wide and interesting a field for specialists with leisure should continue year after year unoccupied.

A few doubtful natives, having for the present the benefit of the doubt, appear in the Catalogue. Thus, *Euchrœus quadratus*, p. 5, is liable to strong suspicion of an alien origin. Mr. Smith says in litt. that he has good grounds for supposing that the specimen described by

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Mr. Shuckard was not taken at Swansea. The name *quadratus* should be changed, as *E. quadratus* Dahlb. is a different insect. The other species whose British origin requires confirmation are *Listrodromus lapidator*, p. 25; *Eurylabus larvatus*, p. 26; *Pristiceros serrarius*, ibid.; *Linoceras macrobatus*, p. 41; *Nematopodius formosus*, p. 42; *Catalytus fulveolatus*, p. 45; *Agrothereutes abbreviator*, ibid.; *Nototrachys foliator*, p. 50; *Scolobates* (both spp.), p. 65; *Sphinctus serotinus*, p. 79; *Theronia flavicans*, p. 86; *Rhytidogaster irrorator*, p. 103; and *Gymnoscelus tardator*, p. 119.

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XIII. *Descriptions of new genera and species of* Tenébrionidæ. By Frederick Bates.

[Read 2nd December, 1872.]

The following is a list of the new genera and species described in this paper:—

Aphtora (n. g.) *rufipes*	New Zealand.
Diphyrhynchus ovalis	New Caledonia.
„ *Caledonicus*	„
„ *nigrobrunneus*	„
Saragodinus (n. g.) *Duboulayi*	West Australia.
„ *Howitti*	„
Nyctozoilus reticulatus	New South Wales.
Hypocilibe (n. g.) *Macleayi*	Queensland. ?
Onosterrhus marginicollis	West Australia.
„ *opacus*	„
Ephidonius Duboulayi	„

Aphtora, n. g.*

Mentum trapezoidal, the face or disc prominent, plane, and transversely quadrangular, the sides anteriorly, and apex strongly inflexed: last joint of *labial palpi* oval or subcylindric; the *maxillaries* rather robust, the last joint oval or subcylindric, the apex obliquely truncated: *antennæ* sparsely pilose, the 3 terminal joints forming a slightly compressed club; joints 3-8 compact, subequal, or very gradually wider and shorter, 9-10 much wider, transverse, subtriangular, subperfoliate, 11 large, rounded at apex: *labrum* distinct, transverse, sparsely pilose: *head* immersed in prothorax up to the eyes, trapezoidal anteriorly, frontally depressed; fore angles of *epistoma* rounded, the apex slightly and broadly emarginate, the suture perceptible by a dark line at each side, and a depressed line behind: *eyes* rather large, prominent, transverse, almost entire: *prothorax* wider than long, sides contracted in front, apex arcuately emarginate, sides strongly margined, reflexed, the apex and

* Tribe *Ulomides*, group ii. *Triboliides*, Lacordaire.

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base finely margined; base bisinuately emarginate, a slight impression at each side the middle gives the appearance of a median basal lobe: *scutellum* strongly transverse; *elytra* oblong, convex, a little wider than the prothorax, sides subparallel, rather strongly margined (especially at base and apex), reflexed; base emarginate; humeral angles prominent: *epipleural fold* entire behind: *prosternal process* curved round the coxæ: *mesosternum* declivous: *intercoxal process* narrow, triangular, apex narrowly rounded: *legs* short; *femora* rather robust, compressed; *anterior tibiæ* triangular, the outer margin very finely denticulate; the 4 posterior sublinear, the outer apical angle of the intermediate produced (not dentiform): last joint of all the *tarsi* elongate, the 1st joint of the posterior longer than the 2 following united.

This genus is evidently related to *Phtora;* it is distinguished from it by its much larger size, relatively broader form, differently formed mentum,* large transverse scutellum, base of prothorax bisinuately emarginate, and epistoma produced beyond the level of the insertion of the antennæ, not broadly rounded.

A. rufipes, n. sp.

Long. 2 lin.; oblong; nitid; piceous; legs, antennæ, palpi, labrum and anterior border of head rufous; head and prothorax finely and evenly punctured; elytra punctate-striate, the striæ very faint, obliterated at sides and at apex; intervals very finely and not closely punctured; underside pitchy, very finely reticulately rugulose and punctured; prosternum with a few scattered longish hairs.

Hab.—New Zealand. One example.

This must be very near to the *Phtora Lifuana* of Montrouzier, but his description, being so brief, is almost worthless; for comparison he describes it as of an uniform ferruginous-brown colour; if that be so, it is a different species from ours.

Heterocheira (Dej.) *Australis*, Boisduval (*Uloma*).—Lacordaire, Genera, V. p. 335, note, has briefly charac-

* In the present genus the *mentum* appears, on a first view, to be transversely quadrangular, but, on a closer examination under a high power, the sides anteriorly and the apex are found to be strongly inflexed, so that the form is really trapezoidal.

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terized this genus, which he places with the ULOMIDES, near *Alphitobius*. I have before me an example out of the Dejeanean collection, which perfectly accords with Lacordaire's description, *as far as it goes;* but when he gives "Les autres caractères et le facies comme chez les *Alphitobius*," it proves that he had not sufficiently examined his insect. The genus has really the most intimate relationship with *Diphyrhynchus*, Fairmaire; and although preserving certain characters that seem to ally it to *Alphitobius*, must, by its large and prominent eyes, its externally widely open mesocoxal cavities and exposed trochantins, belong, without doubt, to the *Diaperides*. Besides the characters given by Lacordaire, as differentiating the genus from *Alphitobius*, it has the *antennæ* elongate, slender, scarcely perceptibly compressed, the outer joints gradually larger and perfoliate, joints 2-10 obconic, 11 large, ovoid: *mentum* small, disc strongly convex and carinate down the centre, sides curvedly contracted anteriorly and somewhat inflexed, apex broadly emarginate: last joint of maxillary palpi securiform, the apical angle a little produced:* *prosternal process* declivous and broadly lanceolate behind, the tip slightly recurved: *mesosternum* less horizontal above, less vertical and less deeply excavated in front: *prothorax* slightly but distinctly sinuous at base and apex, the angles not at all prominent: *elytra* truncate at base, the *epipleural fold* strongly narrowed behind and not nearly attaining the apex of the elytra. *Diphyrhynchus* may be distinguished from *Heterocheira* by having the eyes smaller, less prominent, and emarginate in front; the notch in the epistoma deeper and more angular; the antennæ stouter, the joints shorter, scarcely perceptibly perfoliate, the outer five joints distinctly larger and broader, the 11th suborbicular; the prothorax arcuately emarginate in front; the metasternum shorter; the prosternal process horizontal and more produced and pointed behind; the mesosternum more prominent, more vertical and more deeply excavated in front; the tibiæ more robust, the four posterior elongate-triangular; and the epistoma of the ♂ produced in front at each side into a broad slightly recurved horn. In both genera the four first joints of the

* Lacordaire, l. c. p. 334, note (1), disputes Mulsant's definition of the form of the last joint of the palpi in *Alphitobius*. My own examinations confirm Mulsant's: I find the last joint of the labial palpi to be subcylindric and truncate at tip, that of the maxillary oblong-oval and obliquely truncate at apex.

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intermediate tarsi are strongly, and those of the anterior more broadly, dilated in the ♂ than in the ♀.

I have received specimens of *Heterocheira australis* from Swan River, West Australia.

Diphyrhynchus ovalis, n. sp.

Long. 2½ lin.—Elongate-oval; entirely bronzed-green, shining, the underside very dark bronzed-brown and slightly iridescent, organs of the mouth and base of antennæ dark-red; head and thorax very finely punctulate; on each elytron nine rows of faint punctures, most perceptible at the sides and apex, intervals minutely punctulate, posteriorly and at the sides (on their apical half) the elytra are rather strongly striated; prothorax gradually curvedly narrowed from the hind angles, the median basal lobe broadly rounded behind.

Hab.—New Caledonia. One example, ♀.

This species must be very close to *D. Nicobaricus*, Redtenb., but he gives his species as having the antennæ, legs, and inflexed margins (= epipleural fold) of elytra brunneous. From *D. chalceus*, Fairm., and the species described below, it may be at once distinguished by the prothorax gradually curvedly narrowed from the hind angles, the apex narrower, and by the faint punctuation on the elytra; from *D.* (*Acanthosternus*) *Halorageos*, Montrouz., it may be known by its much larger size and differently formed prothorax.

D. Caledonicus, n. sp.

Long. 2⅓ lin.—Oblong, sub-parallel; shining; elytra of a rich castaneous-brown with a slight brassy tinge, the prothorax (except the margins) darker, legs and antennæ red, underside reddish-brown; head transversely depressed across the front, finely punctured; antennary orbits convex; prothorax very minutely punctulate, moderately rounded at the sides, and more contracted anteriorly than posteriorly, the median basal lobe truncated behind; elytra oblong, subparallel, each with nine lightly impressed punctured striæ, much stronger at the apex; intervals sparsely and very minutely punctulate, and convex at the apex.

Hab.—New Caledonia. One example, ♀.

The form of this species closely approaches that of *Heterocheira australis*.

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D. nigrobrunneus, n. sp.

Long. 2½ lin.—In this—which is possibly but an extreme variety of the preceding—the elytra are blackish-brown, paling into brunneous at the sides, and the underside is of a darker brown with a greenish tinge; the elytra are gradually but distinctly expanded from the humeral angle to behind the middle.

Hab.—New Caledonia. One example, ♀.

D. chalceus, Fairm., occurs also in New Zealand.

SARAGODINUS, n. g.*

Mentum rhomboidal, disc convex, impressed at sides and, slightly, at apex: *labium* partly concealed by the produced apex of the mentum, strongly angularly notched in front; *palpi* long, robust; the labials more (*Duboulayi*) or less (*Howitti*) pendulous in the ♂; the terminal joint of all (♂) large and strongly cultriform: *mandibles* bifid at apex: *labrum* transverse, broadly emarginate in front and ciliate with long rufous hairs, the angles rounded: *head* deeply but somewhat loosely immersed in the prothorax; contracted behind the eyes;† antennary orbits short, prominent, abruptly rounded; *front* and *epistoma* depressed; the latter trapezoidal, the sides reflexed and slightly thickened at the margins, the apex faintly emarginate; an angular depression in front of the eye, this—with the depressed front—gives the appearance of an elevated ridge extending obliquely from the inner corner of the eye to the side of the head at the junction of the antennary orbit and epistoma: *eyes* divided, the upper portion largest, convex, transversely ovoid: *antennæ* short, compressed (especially outwardly), joint 3 elongate, 4-7 subequal, subobconic, the inner apical angle slightly produced, 4-10 subperfoliate, 8-10 gradually shorter and broader, 11 smaller than 10, transverse, the apex broadly rounded: *prothorax* transverse, fully one third wider at base than at apex; sides foliaceous, reflexed, rapidly and slightly sinuously expanded from apex to beyond the middle (*Duboulayi*), thence somewhat sinuously contracted to the base; an oblong shallow depression at the middle of the

* Sub-fam. *Helæinæ*.

† This can only be seen when the head is protruded.

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base, and a trace of a dorsal median line; apex strongly emarginate, the angles prominent, subacute and slightly outwardly directed (♂); base closely applied to the elytra, more (♀) or less parabolically emarginate at each side (*Duboulayi*), or simply bisinuate (*Howitti*), hind angles prominent, directed behind and overlapping the humeral angles of the elytra: *scutellum* small, situate on a lower plane than the elytra, transverse, broadly triangular behind, almost concealed when the base of the prothorax is closely applied to the base of the elytra: *elytra* elongate-oval (*Duboulayi*) or briefly oval (*Howitti*), but little wider (♂ *Duboulayi*) than the prothorax at its widest part, middle of base truncated, shoulders broadly and slightly angularly rounded and reflexed at the margins; posteriorly rather abruptly declivous, the apex a little produced: *epipleural fold* concave from before the middle to apex (♂), only at the apex (♀): *prosternum* very full and convex, the anterior coxæ fitting rather loosely in their cavities: *prosternal process* horizontal, prominent behind, terminating in a blunt point in *Duboulayi;* curved round the coxæ in *Howitti: mesosternum* prominent, or convex above, subvertical in front and narrowly concave, loosely receiving the prosternal projection in repose in *Duboulayi;* flat above, declivous and broadly concave in front in *Howitti: episterna* of mesothorax sub-triangular, partly enclosed laterally by the epimera: *metasternum* very short: *intercoxal process* broad, sides parallel, apex very broadly rounded or subtruncated: *legs* elongate, moderately stout; *femora* sublinear, rather strongly compressed; *anterior* tibiæ sublinear, strongly compressed, slightly expanded and keeled externally, having a broad sharp tooth near the apex outwardly, and immediately in front of this a semicircular excision, the apex broadly rounded; the outer spur large, robust, externally apical; the inner small, acute, internally apical: the four posterior tibiæ slightly gradually thicker apically, slightly compressed (*Duboulayi*), the posterior longer than the intermediate, the outer apical angle acute (not dentiform), the outer spur much shorter than the inner: *tarsi* elongate, sparsely pubescent above, broadly concave (♂ *Duboulayi*) or simply flattened (*Howitti* and ♀ *Duboulayi*) and glabrous beneath, the sides and apices densely fringed with fine golden-yellow hairs, more (*Howitti*) or less (*Duboulayi*) long; 1st joint of the posterior longer than the two following united, the last elongate in all: 3rd and 4th ventral

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segments bisinuately emarginate behind, the 4th very strongly so in ♂, less in ♀, the coriaceous hind margin of the same segments indistinct consequent on their being somewhat loosely imbricate.

♀? In what I take to be the female form of this genus, besides the differences already given, the antennæ, legs and tarsi are shorter, the form broader, more massive, more depressed; the palpi much shorter, the last joint of the labials triangular or very briefly cultriform, that of the maxillary moderately cultriform; the prothorax is not *sinuously* expanded at the sides from the apex to beyond the middle, and the fore angles are directed forwards (not outwards, as in the ♂); the anterior tibiæ are unidentate outwardly, (as in the ♂,) but this tooth, and the outer spur, are shorter and blunter, and the apex of the tibiæ is outwardly produced into a short robust support to the outer spur which is implanted in it.

A remarkable genus which takes somewhat the same relative position in the *Helæides* that *Anomalipus* does in the *Opatrides.* The characters that are *decidedly* exceptional to the "tribe," or sub-family, are: the divided eyes; the lozenge-shaped mentum, partially concealing the labium; the short, sub-compressed antennæ; the last joint smaller than the penultimate; the unidentate anterior tibiæ; and the tarsi broadly concave, or flattened, and glabrous on the underside. In form it most nearly approaches *Nyctozoilus obesus*, and it has the broad parallel-sided intercoxal process, and the angular depression behind the scutellum, as in that genus, but the sides of the prothorax are decidedly foliaceous, and the head is differently formed, agreeing more closely, in this respect, with *Saragus:* the form and position of the spurs to the anterior tibiæ also approach the present genus to *Saragus*, through *S. lævicollis;* properly it should constitute a distinct subdivision in the tribe; but I hesitate to do this at present, as I think that, before long, the whole tribe will require remodelling.

There appears to be a good divisional character in the form of the intercoxal process, and in the modifications in form, &c., that the mesothoracic parapleuræ undergo, thus: in *Encara, Pterohelæus, Helæus, Sympetes, Saragus, Ospidus*, and *Cilibe,* the intercoxal process is narrow and more or less attenuate at apex; and the epimera more or less broadly enclose, or shut out laterally, the episterna from the sides of the mesothorax: in *Saragodinus, Nycto-*

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zoilus, *Hypocilibe* and *Onosterrhus*, the intercoxal process is broad, parallel-sided, the apex broadly rounded or subtruncated; and the epimera are more or less posterior, allowing the episterna to more or less widely attain the sides of the mesothorax.

S. Duboulayi, n. sp.

♂ Long. 8 lin.; elytra lat. 4½ lin.—Oblong, subparallel; dull-black with a slight chocolate tinge, the foliaceous margins of the prothorax chocolate-brown: head and prothorax rugosely-tuberculate, the tubercles flattened and more or less run together and shining on the disc of the latter, the sides simply tuberculate, the foliaceous margins reticulately rugose, the edges crenulate: elytra elongate-oval, sides subparallel, distinctly margined in the basal half, less so in the apical half, these margins transversely rugose; an oblong depression behind the scutellum; each with 4 strongly elevated, shining, more or less tuberculiform costæ, these—save the 2 inner dorsal ones at their basal half—are represented by irregular, (both as to form and size) more or less strongly detached tubercles, the subapical ones being largest and umbilicated; there is also a line of more or less elongate, slightly elevated tubercles closely bordering each side the suture which become bifurcate at the scutellar depression: the intervals are narrow, slightly and irregularly rugose, indistinctly punctate, and studded with variously-sized small tubercles round or conical and shining: beneath, the mentum, sterna and flanks of meso- and metasterna are more or less coarsely rugose and punctured, flanks of the prothorax tuberculate: the epipleural fold, save at the base, is ruggedly rugose; abdomen finely and not closely punctured; legs pubescent, femora punctured but not closely, tibiæ closely, finely (except the anterior) reticulately rugose-punctate.

♀? Long. 9 lin.; elytra lat. 5¾ lin. — Oblong-oval, robust; of a similar colour to the ♂ but duller, the tubercles &c. considerably less nitid: the disc of the prothorax is less strongly tubercled, and these are less run together than in the ♂, the foliaceous margins are more strongly rugose and with scattered small tubercles: elytra ample, briefly oval, depressed, much wider than the prothorax at its widest part; the costæ are not so elevated as in the ♂, the 2 inner dorsal ones subcontinuous to near the apex,

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and slightly sinuous, the 2 outer ones more or less broken up into irregularly-formed tubercles; the elevated sutural lines are stronger than in the ♂, crenulated, and become, at the scutellar depression, quadrifurcate; there is also an irregular row of tubercles between each costa; intervals broad, slightly concave, indistinctly rugose, distinctly punctate, and with a few scattered small tubercles: beneath, the punctuation &c. is the same in character but (except on the abdomen) feebler than in the ♂; the prosternal process is more compressed, and consequently more pointed, behind.

Hab.—Champion Bay, West Australia. A single example of each sex captured by Mr. Duboulay, to whom I dedicate the species.

S. Howitti, n. sp.

♂. Long. 5¾ lin.; elytra lat. 4 lin.—Oval, black, a little shining on the elytra; legs, palpi, antennæ and labrum rufescent; much shorter and broader than ♂ *Duboulayi:* mentum slightly angularly notched in the middle at apex; head rather strongly reticulately rugose; prothorax widest behind the middle, sides rounded (not subangulate), base bisinuate, fore-angles narrowly rounded, hind angles acute, disc slightly depressed in the middle, rugosely tuberculate—more finely and confusedly so than in *Duboulayi,* the foliaceous margins more strongly reticulately-rugose than in the preceding: elytra ample, depressed, much wider than the prothorax, very briefly oval or subrotundate, the apex a little produced, shoulders broadly (not subangularly) rounded, sides distinctly margined throughout, broadest—and reflexed—at and behind the shoulders; reticulately and rather strongly rugose and punctured, each with four more or less strongly interrupted costæ (which are indistinctly united behind near the apex), the two inner posteriorly, and the two outer entirely, formed by detached elongate or conical tubercles: intervals each with a row of variously-sized tubercles, those on the first—or juxta-sutural—being very elongate, extending to the base and appearing as a twin costa to the inner dorsal one; the elevated sutural line is crenulated at the outer side and becomes confused towards the base, at the scutellar depression, with the reticulate rugosities common to the whole of the intervals of the elytra: underside and mentum rather coarsely, but not closely,

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punctured; flanks of the prothorax tuberculate; epipleural fold strongly and coarsely punctured and transversely rugose; prosternal process curved round the coxæ behind; anterior tibiæ unidentate as in *Duboulayi*, but the outer edge, from the base to the tooth, is rather strongly crenulate; the four hind tibiæ a little arched, decidedly compressed, hispid and (the intermediate the most strongly) asperous, with the outer edges finely denticulate: the pilose fringing to the tarsi much larger than in *Duboulayi*, and almost villose.

Hab.—Champion Bay, W. Australia. One ♂ example captured by Mr. Duboulay.

By its differently formed prothorax and elytra, the prosternal process curved round the coxæ behind, the crenulated outer margin of the anterior tibiæ, and the bowed four posterior tibiæ, with their outer margins denticulate, this species might almost fittingly be erected into a distinct genus.

Nyctozoilus reticulatus, n. sp.

Long. 7½ to 8½ lin.; elytra lat. 4½ to 5¼ lin.—Elongate-oval, convex; dull-black, squalid; legs, &c. and underside deep black; head and prothorax finely and evenly punctured; the former depressed on the crown (between the eyes), the antennary orbits obliquely rounded at the sides, flattened above; *epistoma* short, trapezoidal, separated from the front by a strongly impressed line, angular at the sides, front angles rounded, apex broadly emarginate; *labrum* strongly transverse, the membrane attaching it to the epistoma distinctly visible, front angles strongly rounded, apex deeply emarginate: *prothorax* transverse, wider at base than at apex, sides moderately rounded, the edges thickened, the margins expanded and concave; apex arcuately emarginate, the emargination sometimes a little angular at the sides; base bisinuate, closely applied to the elytra, all the angles prominent, subacute, slightly outwardly directed, the hind overlapping the humeral angles of the elytra; with two (the upper and innermost one largest and oval) foveate depressions at each side the middle of the disc, between these an oblong depression and another—transverse, linear and sub-basal—extending along the whole width of the disc; the margins at the hind angles slightly plicate: *scutellum* rather large, convex, transversely triangular, faintly punctured; *elytra* oblong-oval, convex,

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obliquely declivous behind, the apex narrowly rounded; triangularly depressed behind the scutellum; each with four (the outer one close to the margin) slightly elevated costæ, which are somewhat flexuous and connected behind near the apex, and an elevated sutural line, little distinct except near the base bordering the scutellar depression; these costæ put forth lateral branches which form an irregular open network of costiform lines, the interstices slightly concave and more or less punctured; sides very narrowly margined and feebly reflexed: *prosternal process* horizontal, plane or slightly convex, prominent and obtusely pointed behind, margined at the sides and faintly uni- or trisulcate down the middle; *mesosternum* subvertical in front and broadly concave: *intercoxal process* normal: *epimera* of mesothorax posterior, widest within; the *episterna* quadrangular, broadly attaining the sides of the mesothorax: third and fourth ventral segments broadly emarginate behind, their coriaceous hind margins broadly visible: underside (including the flanks of the prothorax) finely punctured: *epipleural fold* plane or concave, smooth, not visibly punctured: abdomen finely punctured, faintly (except at the sides) longitudinally rugose: legs smooth, finely and not closely punctured.

Hab.—New South Wales. Five examples.

As the antennæ and tarsi in this genus have not yet been described, I will here state what they are in the present species; in my solitary example of *N. obesus*, the antennæ—as in the type specimen—are wanting.

Antennæ moderate, very slightly compressed; joint 3 elongate, 3-11 perfoliate and hisped at apex; 4-7 gradually a little shorter and broader, obconic, 8-10 shorter, transversely oval, 11 large, ovoid: *tarsi* filiform, tomentose (and the four posterior channeled) beneath, glabrous above; last joint of all elongate, first joint of the posterior longer than the two following united.

N. reticulatus may be at once distinguished from *obesus*, Guérin, and *Mastersii*, Macleay, by the non-rugose prothorax; and from *elongatulus*, Macleay, by the prothorax being much wider than long.

Hypocilibe, n. g.

Differs from *Nyctozoilus*, Guér., in having the gula deeply transversely sulcate; sides of submentum produced

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into a large blunt tooth; last joint of maxillary palpi large, cultriform; joints 8-10 of antennæ rounded, moniliform; antennary orbits longer, less rounded at the sides; epistoma shorter, sides more parallel, strongly foveately depressed at each side, the suture much less strongly marked; eyes larger and broader; prothorax relatively broader, less contracted anteriorly and consequently less strongly and more evenly rounded at the sides, the lateral edges strongly thickened, or produced into an uniform thick fold; elytra much less convex, expanded, sides margined, the edges reflexed, less rounded at the shoulders, without the triangular depression behind the scutellum; epipleural fold relatively broader, more horizontal; prosternal process bilobed behind; tibiæ less compressed, the intermediate slightly curved at the outer side, the four posterior with a tomentose line on their inner face extending from near the base to the apex;* tibial spurs smaller, the inner one very minute in all: body smooth.

The form of the elytra in this genus more nearly approaches that of some species of *Suragus*, but the sides are more rounded. From *Onosterrhus* it may be distinguished by its more expanded and considerably less convex form, the deeply sulcate gula, the large cultriform terminal joint of the maxillary palpi, &c.

In all three genera (*Nyctozoilus*, *Hypocilibe* and *Onosterrhus*) the membranous hinge to the labrum (unless this organ be unduly intruded) is broadly visible.

H. Macleayi, n. sp.

Long. 9¼ lin.; elytra lat. 5½ lin.—Dull black, with a dull reddish-purple tinge at the edges of the elytra, the scutellar region, and on the disc of the prothorax; head punctured; prothorax and elytra very finely and uniformly punctulate; sides of the former, within the thickened margin, slightly transversely rugulose; on each elytron a trace of four (besides the sutural) broad costæ (totally obliterated at the base), and, when viewed obliquely, a faint indication of an intercostal, elevated reticulate structure, most apparent at the suture; a row of well-marked punctures close by the margin, extending from the base to beyond the middle; underside bright-black, finely punc-

* Possibly only a sexual character, as a similar thing is found in some examples of *Onosterrhus* and not in others.

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tured; flanks of prothorax narrowly transversely rugose near the outer edge; three first joints of the abdomen finely, longitudinally rugulose.

Hab.—Australia (Queensland?). One example.

ONOSTERRHUS, Pascoe, Journ. of Ent. ii. p. 451.

In this genus (too briefly characterized by its author) the gula sulcus is represented by a more or less strongly impressed line; the sides of the submentum are produced into a short (but distinct) blunt tooth; the mentum is trapezoidal, but the sides in front are sometimes very strongly inflexed; last joint of maxillary palpi triangulate; antennæ somewhat slender, the third joint very elongate, 8-10 or 9-10 submoniliform, 11 ovoid; head deeply immersed in the prothorax; front depressed, or concave; antennary orbits long, very gradually rounded, the sides more or less reflexed and thickened at the edges; epistoma very short, more or less rapidly widened behind, the margins more or less reflexed and thickened at the edges; the suture more or less distinct at each side, obsolete at the middle; prothorax more or less strongly transverse, the apex deeply arcuately emarginate, sometimes sinuously so, the sides rather sharply widened to beyond the middle, thence gradually sinuate to the hind angles, margins strongly thickened at the edges and slightly sinuous, within this thickened border the sides are more or less broadly chanelled, disc convex, middle of base subtruncate or very slightly rounded, hind angles moderately prominent, more or less acute, outwardly directed, and slightly overlapping the humeral angle of the elytra; scutellum as in the preceding genus and as in *Nyctozoilus:* elytra very convex, elongate-oval, strongly declivous behind, the apex a little produced, sides narrowly margined and reflexed: legs slender, elongate (in the typical species), rather strongly compressed, tibiæ sublinear, the four posterior with a fine tomentose line down the apical half of their inner face or not; spurs small, the inner one minute; prosternal and intercoxal process, flanks of mesosternum, metasternum and abdomen as in *Nyctozoilus* and *Hypocilibe.* Type, *O. lævis,* Pascoe.

O. marginicollis, n. sp.

Long. 7½ lin.; elytra lat. 4⅙ lin.—Larger and relatively broader than *O. lævis;* of a more shining black; head

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more strongly punctured, antennary orbits longer, the sides more thickened and more reflexed, and canaliculate within the thickened border; epistoma a little shorter, distinctly foveately impressed at each side, the edges thickened and a little reflexed, broader in front, the sides more distinctly marked off from the antennary orbits, the suture much more distinctly marked; prothorax relatively much wider in proportion to its length, more regularly rounded and less sinuous at the sides, the apical emargination simple (not sinuous as in *lævis*), the fore angles less prominent, less acute, and directed forwards (not outwards as in *lævis*), the hind angles somewhat less produced, less acute, the lateral marginal grooves broader: elytra wider, more broadly rounded at the shoulders, very slightly depressed on the back: prosternal process broader behind: legs shorter and stouter, the four posterior tibiæ without any trace of a tomentose line on their under face.

Hab.—West Australia. A single example captured by Mr. Duboulay.

May this possibly be a sexual form of the typical species?

O. opacus, n. sp.

Long. 7 lin.; elytra lat. 3½ lin.—Oblong, subparallel, black, opaque; head as in *lævis*, but the sides of the epistoma are still more completely continuous with the sides of the antennary orbits, the suture being obsolete at the sides: the antennæ are a little more robust, the joints (especially the third) shorter, the outer ones more decidedly perfoliate, 8-10 subcupuliform; last joint of the maxillary palpi very briefly cultriform; prothorax more transverse, squarer, sides not nearly so strongly narrowed anteriorly, margins less thickened, middle of base more distinctly truncated, angles much less prominent and less acute; elytra less strongly convex, sides subparallel from near the humeral angles, more abruptly declivous behind; gular furrow more strongly marked; prosternal process abruptly contracted behind the coxæ; legs as in the preceding.

Hab.—West Australia, Champion Bay. A single example captured by Mr. Duboulay.

At once to be distinguished from the preceding by its opacity, squarer prothorax, and parallel-sided elytra.

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Ephidonius Duboulayi, n. sp.

Long. 9½ lin.; elytra lat. 4½ lin.—Similar in general form and colour to *E. acuticornis*, Pascoe, but of a deeper black: head sparsely punctured; labrum prominent, deeply angularly emarginate in front; epistoma deeply and almost semicircularly emarginate in front, broadly revealing the membranous attachment, or hinge, of the labrum, the suture very strongly marked, arcuate, and sinuous in the middle; prothorax minutely and distantly punctulate, base bisinuate, the hind angles produced and subacute, the median basal lobe subtruncate at the middle, sides rather broadly attenuate and slightly reflexed, disc but little convex, and with several shallow foveæ at each side, those near the base being the most marked: elytra depressed, each with three—besides an indistinct submarginal one—narrow, rather sharp costæ, broadest at base and gradually fining out as they near the apex, which they do not attain, these costæ are each surmounted by a range of small shining tubercles which are continued to the apex after the costæ have died out; intermediate between each costa is a row of similar tubercles, and there are also four rows of small punctures between each costa, the suture is also slightly elevated and bears a similar row of tubercles at each side but rather more closely set than the intercostal rows; the sides are rather broadly, and somewhat sinuously, margined from behind the shoulders: tibiæ straight, linear, asperous, the anterior abruptly produced within at the apex; underside sparingly punctured; epipleural fold strongly concave from near the base to the apex; prosternum rather strongly compressed in front, very prominent between the coxæ, rather strongly margined at each side, its process gradually sloping behind, the sides flattened out and expanded behind the coxæ, the middle prominent and strongly compressed.

Hab.—West Australia, Champion Bay. A single example captured by Mr. Duboulay.

From the form of the anterior tibiæ, and the strong anterior emargination of the labrum, I judge this specimen to be a ♂.

It is necessary to add to the description given by the author of this remarkable genus, that the eyes are very distant from the prothorax, the front is abruptly arcuately declivous at its junction with the epistoma, so that the latter is really on a lower plane than the hinder parts of the head; it is also very short, rapidly curvedly narrowed

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to the front, the apex more or less deeply emarginate, the front angles more or less strongly rounded, the suture very strongly marked; the labrum is more or less prominent, the apex emarginate (sometimes angularly so), the membranous hinge always strongly visible unless the organ be unduly intruded: the mentum is very remarkable, the sides being rather broadly attenuate, the disc prominent, or convex, and having a large triangular piece scooped out, as it were, from the upper part of its face; the throat is deeply longitudinally sulcate down the centre, from the base of the mentum, and becomes fainter and bifurcate behind: the prothorax is more or less widely attenuate at the sides, the base distinctly sinuate, and broader at the hind than at the front angles; the elytra have a slightly reflexed margin, more or less broad, from behind the shoulders to the apex: the epipleural fold is broad, gradually narrowing from base to apex, more or less strongly concave from near the base to the apex: the prosternum is more or less strongly compressed before the coxæ; the mesosternum is convex, declivous in front, broadly and deeply channelled along its length, and with a triangular excision at the front margin, its episterna are triangular and more or less broadly shut out from the sides of the mesosternum by the epimera, which are very largely developed; the episterna of the metathorax are narrow, the sides parallel, and the epimera are very distinct; the intercoxal process is narrow and attenuate at apex; the legs are long, slender, the tibiæ linear and more or less strongly asperous; the first joint of the posterior tarsi is shorter than the last, and the claws are very elongate.

The position of this very remarkable genus, as well as that of *Brises*, Pascoe, is at present very uncertain.

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XIV. *Supplementary Note on the genus* Acentropus. By J. W. Dunning, M.A., F.L.S.

[Read 2nd December, 1872.]

By way of supplement to my notes (*ante*, pp. 121—156), I beg to give a few additional references and localities for *Acentropus*. To the list of localities (p. 153) there may be added

England (Sheerness, *J. J. Walker;* Peckham, *Cowley*).
Scotland (Loch Leven, Kinross, and Loch Gelly, Fife, *Syme*).
Sweden (Ifösjön, Ringsjön, Wombsjön, Farhult, *Wallengren*).
Belgium (Forest of Linthout, *Andries;* Brussels, *Fologne*).
Holland (Overween, and Texel, *Ritsema*).

And to the list of authors—

1859. Fologne, Ann. Soc. Ent. Belg. iii. 134.
1870. „ „ xiii., Comptes rendus, p. xxxvi.
1871. Syme, Scottish Naturalist, i. 20.
„ Wallengren, Öfv. Vetenskaps-Akad. Förhandl. xxviii. 973, 1009.
1872. J. J. Walker, Ent. Mo. Mag. viii. 185.
„ F. Walker, Entom. vi. 107 (in a note on *Ophion*).
„ Newman, Zool. S. S. 3117, and Entom. vi. 153.
„ J. P. Barrett, Entom. vi. 199.
„ Corbin, Entom. vi. 233 (misprinted *Atropus* niveus).
„ Roelofs, Ann. Soc. Ent. Belg., Compte rendu, 6 July.

Ritsema has kindly sent me a print of his "Aanvulsel tot het geschiedkundig overzigt van het geslacht Acentropus," which will be published in 1873 in the "Tijdschrift voor Entomologie," vol. xvi. pp. 16—25. In a note on p. 25 he tells us that he captured male specimens of the moth at Overween as early as the 12th May, and (as also recorded by Roelofs) in the Island of Texel on the 29th

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May. In this country Boyd found it at Cheshunt on the 1st June; and Corbin at Ringwood from the beginning of June to the end of August. The latter writer mentions various enemies that prey upon *Acentropus*. F. Walker and J. P. Barrett both record instances of the moth being attracted to light. Syme's capture of the insect in Scotland is interesting as corroborating Leach; he mentions *Potamogeton filiformis* as the species of pondweed which it frequented, whilst J. J. Walker mentions *P. pectinatus*. Boyd found pupæ at Cheshunt on the American weed, *Anacharis alsinastrum;* the moth and the *Anacharis* were abundant, *Potamogeton* was very scarce in that locality; but there is as yet no evidence that the larvæ fed on *Anacharis*. The prominent lateral spiracles are not confined to the pupæ of *Acentropus*, but occur likewise in the pupæ of some at least of the *Hydrocampidæ*. As to the presence of tibial spurs in the perfect insect, see Snellen's observation quoted by Ritsema (Tijd. v. Ent. xvi. 19, n.), confirming what is stated *ante*, p. 130. Wallengren, in his "Skandinaviens Pyralider," published in the 28th vol. of the Stockholm "Öfversigt," places *Acentropus* in and at the end of the family *Botydæ*, distinguishing it (at p. 973) from the other sixteen genera by the characters "legs without spurs; female wingless; ocelli and superior palpi wanting;" or, as it is expressed at p. 1009, "legs short and thin, without spurs; the female with short pointed rudiments of wings." According to the same author (who thus confirms Reutti's statement, *ante*, p. 138) "the female is on the move by night, and swims on her back under the water, and for pairing she also draws down the male, which flies just over the surface of the water, and also runs pretty quickly on the water; the male is chiefly on the move by night, but flies also by day." Wallengren (referring to Nolcken's paper) adds that there are probably several species of the genus, and that sometimes winged females occur; he however cites Kolenati's figure of *A. Nevæ* as identical with A. *niveus*. With reference to Newman's remark (Zool. S. S. 3122) that the conflict between the two descriptions of the eggs, noticed *ante*, p. 133, is "sufficient to prove that the eggs described were scarcely those of a single species," I may observe that Newman has failed to notice that the conflicting descriptions were given of one and the same batch of eggs, deposited on one and the same *Potamogeton*-leaf.

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XV. *On the manner in which the ravages of the larvæ of a* Nematus, *on* Salix cinerea, *are checked by* Picromerus bidens, L. By ALBERT MÜLLER, F.L.S.

[Read 2nd December, 1872.]

ON the 30th September last I happened to saunter over the summit of Shirley Heath, when my attention was attracted by an isolated bush of *Salix cinerea* growing in a slight hollow of the heath. Already from a distance I could perceive that something unusual had taken place, as all the top shoots were entirely deprived of their foliage. A closer examination revealed the following state of things. Hundreds of saw-fly larvæ in different stages of growth were feeding on the middle and lower branches. The top branches had entirely been cleared by them of every leaf, the bare branches retaining only the mid-ribs and a few shreds of the stronger lateral ribs. Each leaf, or more correctly the series of leaves of each twig, were occupied by individuals of the same size; thus separate twigs exhibited distinct broods, of which (to judge by size only) I counted four of different ages.

While feeding, the individuals of all these broods clung to the edges of the leaves by means of their three pairs of pectoral feet, the body resting curled up mostly on the under side of the leaves, but directly a twig was shaken the hind-bodies were violently thrown upwards, and then generally remained in that position for some time, until the branch was again disturbed, when a whipping to and fro of most of the upturned hind-bodies would follow. I could not perceive the emission of any odour or secretion so long as the larvæ were not actually handled, but if taken up by the fingers a fœtid smell became at once perceptible. The following description is taken from a full-fed larva, captured on the ground below the bush:—

Length, 2 centimètres; width, 2½ millimètres; width of the head, 2 millimètres; 20 feet (6 pectoral, 12 ventral, 2 anal); between the 3rd pectoral pair and the 1st true ventral pair, a slight conical protuberance on each side seems to represent an abortive pair of ventral legs; the 11th ventral segment is footless. Head shining black;

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buccal organs piceous, body greenish-yellow, dorsal region with three black longitudinal and parallel stripes; segment next to the head without any mark or spot whatever; above the ventral feet a row of black more or less oval raised spots. Pectoral legs spotted very slightly, each with a blackish horny shield sideways exteriorly; between each pair of ventral feet a yellowish wart-like protuberance. In one set of younger (?) larvæ on the bush, the central dorsal stripe was entirely absent.

I have in vain endeavoured to identify these larvæ with those described by Brischke, Zaddach and Thomson. My larvæ are evidently the same as those figured by Réaumur, (Mémoires, T. V., pl. 11, figs. 3, 4), and the same as those described by Hartig (Blattwespen, etc., p. 218) as belonging to his *Nematus ochraceus*.

Several of them have since (4th October, 1872) spun their oval cocoons of a pale-yellowish silk at the bottom of a glass vessel in which I had confined them, so I hope to report their correct name on a future occasion.

While I kept watching the bush in question, I noticed a number of a species of *Hemiptera*—*Picromerus bidens*, L. —occupied with sucking the juices of these saw-fly larvæ; and to judge by the great number of dead half-shrivelled larvæ lying underneath the bush, this wholesale slaughter must have been going on for some days. Specimens of this bug came at irregular intervals crawling up the various branches leading to the twigs where their victims were feeding. One of these *Hemiptera*, which I kept watching at convenient times on my return home, where I supplied it with some branches full of feeding larvæ, proceeded as follows in satisfying its appetite:—

1.35 P.M. — Saw the *Picromerus* sucking one of the larvæ; sucker inserted near the middle of the underside of the body; larva struggling but held partly aloof, spitted on the rostrum. For a moment the Hemipteron held on by the fore legs only, the hind legs being cleansed by being rubbed against each other. The saw-fly larva was quite helpless within a quarter of an hour, appearing then but slightly emptied. The bug now put it down on the leaf, and pressing its fore legs against the body, withdrew its rostrum, which was then slowly and carefully cleaned by being passed between the anterior tarsi. With the cleansing of the antennæ it proceeded in a different manner. These appendages were alternately passed through a notch at the end of each anterior tibia.

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1.55.—The *Picromerus* deliberately but very cautiously approaches another feeding larva, and drives its outstretched rostrum into the middle of the underside of its body; the victim tries to lash its hind body rapidly to and fro, and anchors itself firmly by means of its three pairs of pectoral legs. But the first joint of the aggressor's rostrum has entered its vitals, and is kept at right angles to the remaining joints, so that the larva appears securely hooked.

2.10.—Larva has ceased to struggle: its fore legs have lost their hold. The Hemipteron now pulled it underneath its own body, and held it longitudinally, using both fore legs as arms, and grasping the larva, which is lying on its back, on each side.

3.25.—The bug holds the same larva in the same position, and still sucks its juices.

3.33.—Parts with its victim in the same manner as before, using its fore legs to hold the larva, till the rostrum is withdrawn.

4th October, 1872: 8.20 P.M.—Found the *Picromerus* laying on its back, dead, with fully distended abdomen. From the afternoon of the 30th September last till now it had sucked no less than 36 larvæ of different sizes, that is to say, partly sucked them, as the bodies are by no means emptied. The bug seems only to enjoy its liquid food so long as it can derive the latter from the living body. Directly vital action ceases in the larva sucked, the Hemipteron leaves it. I have on several occasions seen the *Picromerus* first touch its prey with the antennæ, then outstretch its rostrum, and rapidly move the last joint of this organ up and down, a movement of anticipated enjoyment, as it appeared to me.

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Addenda, Delenda, and Corrigenda, in Mr. S. S. SAUNDERS' *Monograph of the* Stylopidæ (*vide antè*, pp. 1—48); *with explanation of Plate VII. illustrating that Article.*

Page 1, note *b*, line 2, for "1816," read "1835."
„ 2, line 10, reverse inverted commas.
„ 2, note *h*, line 2, for "1826," read "1828." (Vide 5th edit. *passim.*)
„ 5, note *x*, for "1861," read "1862 (xxviii. Jahrg. 2 Bd.)."
„ 5, note *z*, for "1863?," read "1864 (xxx. Jahrg. 1 Bd.)."
„ 8, line 6, dele "corresponding (as it would seem) with what Kirby has described as the 'transverse fold in the middle' of a coleopterous wing (Lin. Trans. l. c. p. 101)."
„ 8, line 11, for "the fore-wing," read "either wing."
„ 8, line 24, after "furnished," add "(in the Stylopidæ)."
„ 9, line 8, for "subinterno," read "subexterno."
„ 9, line 10, after "abnormal," add "and apocryphal."
„ 16, note *b*, for "sec." read "ser."
„ 18, line 22, for "colligantur," read "colligati."
„ 18, line 32, after "pariter," add "omnium."
„ 20, last line, for "HOMOPTERABIARUM," read "HOMOPTEROBIARUM."
„ 26, line 37, for "scilicit," read "scilicet."
„ 26, line 40, dele "Kirby and Spence, Introd. to Entomology, Tom. 1, Tab. 2, fig. 1, 1828."
„ 27, line 21, after "Melittæ," add "insertum;"
„ 27, line 31, for "oriundæ," read "oriundas."
„ 28, line 13, for "p. 683 bis," read, "p. 633 bis."
„ 28, line 18, after "differt," add "antennarum."
„ 29, line 4, for "altore," read "cum altore."
„ 29, line 16, *et passim*; for "HYLECTHRUS," read "HYLECHTHRUS."
„ 29, line 21, after "latere externo," add "(sc. *antice*, antennis utrinque deflexis)."
„ 31, line 8, after "ineunte," add "anni sequentis."
„ 31, line 15, for "cephalothorace," read "cephalothoracis."
„ 31, line 31, for "1a et 2a," read "1o et 2o."
„ 39, line 8, add "Kirby and Spence, Introd. to Entomol., Tom. 1, Tab. 2, fig. 1."
„ 44, line 21, for "externo-medium," read "externo-mediam."
„ 45, line 13, for "spicie," read "specie."
„ 47, line 7, dele "commus."
„ 48, line 35, for "opportet," read "oportet."

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PLATE VII.

Fig. 1. Wing of *Stylops*.
- *a*. area costalis, Kirby.
- *b*. area intermedia, K. superior.
- *c*. area intermedia, K. inferior.
- *d*. area analis, K.
- 1. neura mediastina, K.
- 2. neura postcostalis, K.
- 3. neura 1ma insulata apicalis.
- 4. neura 2nda insulata discoidalis.
- 5. neura externo-media, K.
- 6. neura subexterno-media, K.
- 7. neura interno-media, K.
- 8. neura subinterno-media, K.
- 9. neura analis, K.

Between Nos. 6 and 7 is seen the rudimental neura spuria, K., represented by dots. (See p. 9.)

2. Wing of *Myrmecolax Nietneri*, Westw.*
3. Wing of *Xenos Rossii*, K.
4. Wing of *Hylechthrus rubi*, S. S. S.
5. Wing of *Paraxenos Erberi*, S. S. S. (p. 46).
6. *Pseudoxenos Schaumii*, S. S. S. (p. 44).
7. Head of same seen from above.
8. Mandible of same.

8*. Palpus of same.

9. Antenna of same seen sideways.
10. Apex of one of the elongated joints of ditto.
11. Apex of abdomen of same.
12. Tarsus of same.
13. Antenna of *Paraxenos Erberi*, S. S. S.
14. Foreleg of same.
15. Tarsus of same.

S. S. S.

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* I am by no means satisfied as to the correctness of this figure, the specimens sent by Mr. Nietner being in so very fragmentary a condition, that the true relation of the veins here figured may be doubtful.

J. O. WESTWOOD.

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PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON

FOR THE YEAR

1872.

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5 February, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Prof. Westwood thanked the Society for electing him to fill the office of President; and nominated Messrs. E. Saunders, F. Smith and H. T. Stainton as his Vice-Presidents for the year.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Bulletin de la Société Linnéenne de Normandie,' vol. viii.; 2nd Series, vols. iii. and iv.; presented by the Society. 'Transactions of the Linnean Society of London,' vol. xxvii., pt. 4, and vol. xxviii., pt. 1; by the Society. 'Catalogue of Dermaptera Saltatoria,' parts iv. and v., by Francis Walker; 'Catalogue of Hemiptera Heteroptera,' part iv., by Francis Walker; by the Trustees of the British Museum. 'The Transactions of the Entomological Society of New South Wales,' vol. ii., part 3; by the Society. 'Stettiner entomologische Zeitung,' xxxii., Nos. 10—12; xxxiii., Nos. 1—3; by the Society. 'L'Abeille,' 1871, livr. 12; by the Editor. 'The Silk Supply Journal,' No. 13; by the Silk Supply Association. 'Lepidoptera Exotica,' part xi.; by E. W. Janson. 'The Canadian Entomologist,' vol. iii., Nos. 9—12; by the Editor. 'Description de Six Coléoptères éclos à Paris;' 'Monographie du genre Rhinochinus;' by the Author, M. A. Chevrolat. 'Description d'une Anomalie observée chez un exemplaire de Hestia Belia, Westwood; by the Author, M. L. Quaedvlieg. 'Catalogue synonymique et descriptif d'une petite collection de Fourreaux

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de larves de Phryganides de Bavière;' by the Author, M. A. Preudhomme de Borre. 'On the Origin of Insects;' by the Author, Sir J. Lubbock, Bart. 'A Letter concerning Deep-Sea Dredgings, addressed to Professor Benjamin Peirce, Superintendent United States Coast Survey;' by the Author, L. Agassiz. 'Nye Dybvands crustaceer fra Lofoten,' af G. O. Sars; 'Bidrag til Kundskab om Christianiafjordens Fauna,' ii., af Michael Sars; 'Efter Forfatterens efterladte Manuskripter samlet og udgivat af huns Son G. O. Sars;' 'Carcinologiske Bidrag til Norges Fauna—I. Monographi over de ved Norges Kyster forekommende Mysider,' Forste Hefte, af G. O. Sars; by M. G. O. Sars. 'Om en i Sommern 1869 foretagen entomologisk Reise gjennem Ringuike, Hallingdul og Valdus,' af H. Siebke; by the Author. 'Crustacea amphipoda borealia et arctica,' auctore Axel Boeck; by the Author. 'Cistula Entomologica,' part iv.; by E. W. Janson. 'The Zoologist' for February; by the Editor. 'The Entomologist's Monthly Magazine' for February; by the Editors. 'Monographie der Passaliden,' von Dr. J. J. Kaup; by T. Compton, Esq. 'Tijdschrift voor Entomologie,' Ser. 2, tome vi., Nos. 2—6; by the Entomological Society of the Netherlands. 'Sepp's Nederlandsche Insecten,' Ser. 2, tome iii., Nos. 3—12; by Dr. S. C. Snellen van Vollenhoven. 'The Position of the Caddis Flies;' by the Author, A. S. Packard, jun., Esq. 'A List of the Species of Sphingidæ in the Collection of the Royal Dublin Society,' by W. F. Kirby, Assistant in the Museum; by the Author. 'Contributions à l'Histoire Naturelle et à l'Anatomie de la Mouche-feuille des Iles Seychelles,' Phyllium crurifolium (Audinet Serville), Mantis sicciofolia (Linné), par le Dr. N. Joly: 'Sur l'Hypermetamorphose de la Palingenia Virgo à l'état de Larve; analogies de cette larve avec les Crustacés,' par le Dr. N. Joly; by the Author.

By purchase:—'The Zoological Record for 1870.' 'Catalogus systematicus Dipterorum Europæ,' auctore R. J. Schiner, Dr. 'Skandinaviens Heterocer-fjärilar, beskrifne af H. D. J. Wallengren Första delen.' 'Hymenoptera Scandinaviæ,' auctore C. G. Thomson, tome i. 'De Vlinders van Nederland, Macrolepidoptera, systematisch beschreven door P. C. T. Snellen.'

Exhibitions, &c.

Mr. M'Lachlan brought before the notice of the meeting an illustration of the manner in which the ravages of Aphides are checked by parasitic Hymenoptera. He exhibited a portion of poplar-twig from Dr. Knaggs's garden at Kentish Town, which had been occupied by a large family of dark-coloured Aphides; of these nothing now remained but their empty inflated skins, each of which presented a circular opening, whence the parasite (probably an Aphidius) had emerged, the whole bearing much resemblance to a collection of empty egg-shells of some large Lepidopterous insect. The

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portion of poplar-twig was less than an inch in length, and on it were nearly one hundred of these empty skins.

Mr. Herbert Druce exhibited a large selection of Rhopalocera from Costa Rica, being part of a collection formed in that country by Dr. Van Patten. In all there were probably nearly fifty new species in the collection, including four of Papilio, three of Morpho, three or four of Leptalis, a new genus of Satyridæ allied to Pronophila, &c., &c. These are in course of description by Mr. Butler, in 'Cistula Entomologica.'

Prof. Westwood exhibited specimens and drawings of various species of Acaridæ and other aberrant Arachnida, either entirely new to Science or not previously observed in this country, as follows:—

1. Fam. Trogulidæ. A small species of the genus Trogulus, differing from any of those figured by Koch, captured by the Rev. O. P. Cambridge in moss at Bloxworth, Dorsetshire; described by Prof. Westwood as T. rufitarsis.

2. Genus Stylocellus, *Westwood*. A new genus pertaining to the recently instituted family Cyphophthalmidæ (Joseph, in Berl. Ent. Zeit., vol. xiii.), founded upon a species (S. sumatranus, *Westw.*) from Sumatra, forwarded by M. Snellen van Vollenhoven as a new species of Trogulus. Differing from Cyphophthalmus (the type of which is a minute species from the caves of Carniola) in having the cheliceræ shorter than the palpi, and with the terminal dactyls of the former simple and very acute, and the cephalothorax without a deeply incised emarginate mark, each side being produced into a short obtuse horn. Long. 7½ mm. A second species (S. javanus, *Westw.*) is in the Collection of the British Museum.

3. Argas reflexus, *Latreille*. Type of a family and genus not hitherto recorded as British. A colony of this species had been found by Mr. Gulliver under a stone in the crypt of Canterbury Cathedral. It ordinarily infests pigeons on the Continent, and the colony had probably originated from individuals that had fallen from the flocks of those birds frequenting the Cathedral. (Mr. F. Smith added that specimens of the dog-tick had been forwarded to him that had been found in the same Cathedral, and he has since furnished information to the effect that the British Museum possesses an example of the Argas from the same building.)

4. Argas noctulæ, *Westw.* Perfectly round in outline, the disc of the cephalothorax with deep and large punctures widely scattered, and with radiating punctures towards the margins. Long. 5 mm. Taken from off a gentleman in the church of Whittlesford, Cambridgeshire, having evidently fallen from the larger noctule bat, of which two young individuals had dropped close to the gentleman on whom it had been found, and whom it attempted to bite. Forwarded to Prof. Westwood by Mr. F. Bond. It is closely allied to the Argas pipistrellæ of Audouin, but is very much larger.

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5. Argas persicus ("the poisonous bug of Persia"). The specimen exhibited had been forwarded to Prof. Westwood by the late Herr Westermann, of Copenhagen, who had received it from Col. Motschulsky.

Papers read, &c.

Major Parry read "Descriptions of some new species of Lucanoid Coleoptera, with remarks upon the species comprising the genus Cantharolethrus of Thomson." The new species (which were exhibited by Major Parry) were Cantharolethrus Buckleyii from Ecuador; Sphenognathus armatus from Columbia; Leptinopterus affinis and L. paranensis from Parana.

Mr. Bates remarked that during his residence at Para he had never found any species of this division; it was therefore extremely interesting to him to see the two species now exhibited.

M. Snellen van Vollenhoven communicated a description and figure of an insect belonging to the same division from Java (?), under the name Prosopocoilus Rosenbergii.

Prof. Westwood read a description of a further addition to the division, and exhibited a figure thereof. This was named Ceratognathus rufipennis.

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19 February, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Election of Members.

The following gentlemen were balloted for and elected Annual Subscribers to the Society:—Dr. W. H. Ransom, F.R.S., of Nottingham; H. W. Livett, Esq., M.D., of Wells, Somerset; J. H. A. Jenner, Esq., of Lewes; and G. B. Rothera, Esq., of Nottingham.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1871, Nos. 1 and 2; presented by the Society. 'The Journal of the Quekett Microscopical Club,' No. 17; by the Club. 'Recherches expérimentales sur la position du centre de gravité chez les Insectes, par M. Félix Plateau'; by the Author.

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Exhibitions, &c.

Mr. F. Smith called attention to the fact that mice are in the habit of devouring the dead pupæ of Bombyx mori contained in what is known as 'silk-waste,' *viz.*, the inner cocoon remaining after the external silken envelope had been wound off. This had been brought to his notice by one of his sons as occurring in a London silk-warehouse, and a parcel of the said 'waste' brought to him afforded an instance of a double cocoon, or, rather, a very large cocoon containing two pupæ lying free within it, and evidently constructed by two larvæ working in concert.

Mr. F. Moore said the cocoons were those of Bombyx mori from China. Double cocoons were not of infrequent occurrence; and occasioned some additional trouble in the winding process. Mr. Jenner Weir alluded to the occurrence of double cocoons of Eriogaster lanestris; and Mr. Müller remarked on an analogous occurrence among species of sawflies, though this was scarcely a parallel instance, inasmuch as the sawfly larva merely used one side of an already constructed cocoon as a foundation for its own, and did not act in concert with its fellows.

Mr. Butler exhibited drawings (and a dried specimen) of parasitic larvæ that had emerged from the bodies of caterpillars of Pygæra bucephala, which they almost equalled in size. He had not been able to determine the insect to which the larvæ belonged, as these latter died after spinning a quantity of threads, partly black, partly white, on the surface of the earth in the vessel in which they were placed. It was suggested that they probably pertained to some large species of the family Ichneumonidæ.

Dr. F. Buchanan White communicated the following extracts from his note-book respecting the habits of a species of ant in Italy, bearing upon Mr. Moggridge's remarks on the storing of seeds by ants at Mentone, as noticed by Mr. F. Smith at the meeting on the 1st of January (See Proc. Ent. Soc., 1871, p. xlvii.):—

"Capri, June 3, 1866. In the afternoon to the Punta Tragara, where a colony of ants afforded us much amusement. These little insects had a regular road, made by cutting away the grass and other plants in their way. This road was about one inch and a half wide and several yards long, and led to a large clump of plants in seed. Along this road a long train of ants were perpetually travelling to the nest (or formicarium), bearing with them pods of Leguminous plants, seeds of grass and of Compositæ (Chrysanthemum segetum), &c. The perseverance with which a single ant would tug and draw a pod four times his own length was very interesting; sometimes three or four ants would unite in carrying one burden. Near the formicarium was a great mass of *débris*, consisting of empty pods, twigs, emptied snail-

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shells, &c., cast out by the ants. The seeds appeared to be stored inside the nest, as in one that I opened the other day I found a large collection. . . . . The species was a black ant; the formicarium was under ground."

Mr. Horne had observed, in the open plains of India, a similar habit in species of ants found there. Their pathways were often thirty feet in length, and formed by cutting away the grass, &c., as noticed by Dr. White, and the ants were constantly seen carrying full grass seeds into their nests: the quantity of seeds was sometimes so great that five or six handsfull could be collected from one nest.

Prof. Westwood exhibited the type specimens of the creatures upon which Latreille founded his Crustaceous genus Prosopistoma, with magnified drawings of the same, and remarked thereon with reference to the statement of Dr. Joly (as mentioned at the previous meeting), that these creatures (which were from Madagascar) and 'le Binocle' of Geoffroy, from the neighbourhood of Paris, were immature conditions of species of Ephemeridæ. The creatures had no perceptible mouth organs, and in this respect did not in any way accord with the earlier states of any species of Ephemeridæ; neither did the structure of the legs, though those members were formed differently from anything known in Crustacea. In external form, especially in the largely developed carapace, there was some analogy with the pupa of Bætisca obesa, *Say*, one of the Ephemeridæ, as described and figured by the late B. D. Walsh, but there was little other similarity in the two forms.

Mr. M'Lachlan said he could not reconcile the structure of these types of Prosopistoma with the idea that they pertained to the Ephemeridæ. He exhibited a series of examples, in alcohol, of Boreus californicus, sent to him by Dr. Packard, the describer of the species.

Mr. Albert Müller read the following remarks:—

"In a letter I lately received from Mr. Peter Cameron, jun., of Glasgow, the writer asks 'Have you noticed that the galls on willows overhanging rivers are only on the leaves above the land, very few, if any, being on the leaves over the water? This is the case in this neighbourhood.' The gall referred to by my correspondent is produced by Nematus Vallisnieri, *Hartig*. I certainly have seldom, if ever, seen the galls on boughs overhanging water, but the question requires further investigation. Baron von Osten-Sacken has recorded the same thing of the American plum weevil (*Conotrachelus nenuphar*), which, according to him, avoids trees overhanging water when depositing its eggs. The question of ovipositing insects thus avoiding trees in positions which may be dangerous to their brood, has some practical bearing, where the conservation of foliage or fruit crops is of importance. I

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have myself witnessed that certain water beetles, namely Dytiscus marginalis and several species of Colymbetes, have dropped down on hothouse frames protected by glass. They made this mistake by taking the glass to be their native element; theirs was an error of sight. Assuming that insects injurious to fruit-trees often discern their positions by sight, it seems worth while to offer the suggestion that the means which attracted the water beetles might possibly be made use of for keeping away such insects as avoid water, and which might possibly be scared away by any object simulating that element."

New Part of 'Transactions.'

Part v. of the 'Transactions' for 1871, completing the volume, was on the table.

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4 March, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 131; presented by the Society. 'Coleopterologische Hefte,' Heft VIII.; by the Editor, Baron E. v. Harold. 'The Entomologist's Monthly Magazine,' for March; by the Editors. 'The Zoologist,' for March; by the Editor. 'The Canadian Entomologist,' vol. iv., No. 1; by the Editor. 'The Entomologist,' vol. v., and Nos 99—101, January—March; by the Editor.

By purchase:—Gemminger et de Harold, 'Catalogus Coleopterorum,' tom. viii., pars. 1. Matthew's 'Trichopterygia illustrata et descripta.'

Election of a Member.

Ernest Kaye, Esq., of Oakfield Road, Penge, was balloted for and elected a Member of the Society.

Exhibitions, &c.

Prof. Westwood exhibited living examples of Argas reflexus, from Canterbury Cathedral, of which he brought dried examples before the meeting on the 5th ultimo; also another species of the same genus collected by Dr. Livingstone in Central Africa, remarkable for the rounded tubercles with which its surface is studded. This latter species, according to Dr. Livingstone's observations, enters the feet of the natives, between the toes, causing pain and inflammation.

Mr. S. Stevens exhibited an apparently undescribed species of Phycita, taken near Gravesend, bearing much external resemblance to certain species

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of Crambus, and especially to C. perlellus, of which it possessed the pearly lustre.

Mr. F. Smith stated that he had received a further communication from Mr. J. T. Moggridge, now at Mentone, respecting the storing of grain by ants of the genus Aphenogaster, as mentioned at the meeting on the 1st of January. Mr. Moggridge had confined a colony of the ants in a glass vessel, so as to observe their habits, and he was able to confirm his previously expressed belief that they feed upon the stored grain.

Mr. H. W. Bates exhibited a number of British species of the genus Carabus, arranged side by side with the species which were their nearest representatives in Eastern Siberia, as illustrations of the wide difference which exists between the Coleopterous fauna of Eastern Siberia and of Western Europe. He added that of about fifty species of Carabus inhabiting Eastern Siberia, only one (C. granulatus) was found also in Western Europe, the other forty-nine being quite distinct. He recalled the attention of the Society to the wide acceptance which the zoo-geographical division of the globe, as propounded by Dr. Sclater, had received amongst zoologists. An amendment of these divisions had been since proposed by Prof. Huxley, who, however, did not change that portion of Sclater's generalization which concerned the subject now under consideration, and which established the whole of Europe and Northern Asia as one great division, termed the "Palæarctic." This division appeared to apply very well to the classes of birds and mammals, but not to insects, as was shown by the great amount of difference existing in the genus Carabus and in other genera of Coleoptera. Each species exhibited was accompanied by that to which it was most nearly allied. Thus C. nitens was represented in Eastern Siberia by C. tuberculosus; C. clathratus by C. canaliculatus; C. arvensis by C. conciliatus; C. monilis by C. regalis, &c. No greater amount of difference existed between Northern America and the Palæarctic region, although the former had been separated as a distinct region, termed the "Nearctic." In conclusion, Mr. Bates remarked that he considered no philosophical importance could be attached to vague general divisions of the earth. What was really important was to ascertain the districts which presented a large amount of peculiar forms, and then to investigate the causes and origin of this peculiarity in each case.

In the course of the discussion that followed, Prof. Westwood remarked upon the desirability of ascertaining the range of each species, and of determining the amount of variation or modification presented by it in different districts: and he called attention to the similarity between the insects of Eastern Siberia, Japan, and Western America. Dr. Sharp said that the Spanish Carabi were mostly peculiar to the Iberian peninsula, though some were species known to have a wide range, but modified in this district. He considered that species quite peculiar to mountains were

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necessarily restricted in their range, whereas those found in the plains were of wide distribution. He remarked that all the species of the genus Oxytelus, seen by him, from Eastern Siberia, were specifically identical with those of Britain, whereas of the genus Bledius no species was common to both countries.

Messrs. Weir, Müller, Janson, M'Lachlan, &c., also took part in the discussion, and the two latter remarked on additional instances of the occurrence of allied forms in Eastern Asia and North America, as exhibited in the genus Pteronarcys among the Neuroptera, and Cupes in Coleoptera.

Mr. Müller exhibited galls of an Acarus, probably a Phytoptus, from Bombay, concerning which he read the following notes:—

"My friend Mr. F. Moore has kindly presented me with some leaves of Cinnamomum nitidum, from Bombay, exhibiting on their upper surface isolated, rusty-brown, smooth and hard pouch-shaped excrescences, each of the size of a large pin's head. These excrescences are hollow, and provided on the under side of the leaf with an opening equal in diameter to the basin on the upper side. The sight of these objects enables me to assert the existence in India of a species of gall-producing Acaridæ, probably four-footed, and allied, or perhaps belonging to the extensive European and American genus Phytoptus. In size and structure these Cinnamomum pouches tally with those of the European Phytoptus gall, called by Bremi Cephaloneon solitarium, of which my collection contains British and Continental specimens. But they differ from the latter in being less restricted at the basis, with both inside and outside quite smooth, and in exhibiting on the under side of the leaf a slight rim surrounding the open pouch. The absence of all pubescence from the pouch chiefly distinguishes them from the European form, and this character is quite in accordance with the highly polished, smooth, outer texture of the healthy leaf of Cinnamomum."

Papers read.

Mr. Baly communicated descriptions of various new species of Cassididæ, from Ecuador and Nicaragua.

Mr. W. F. Kirby communicated "Notes on the Diurnal Lepidoptera described by Jablonsky and Herbst in their 'Natursystem aller bekannten Insecten'."

Mr. Dunning read a memoir on the genus Acentropus, in which he brought together a *résumé* of all that had been written on the subject. After commenting upon the opinions expressed by various authors as to the position of the genus, he arrived at the conclusion that it is truly Lepidopterous; and, furthermore, he had failed to find valid reasons for considering that more than one species existed, for which he retained the name Acentropus niveus.

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18 March, 1872.

F. Smith, Esq., Vice-President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—"Annales de la Société Entomologique de Belgique,' tome xiv.; presented by the Society. 'Bullettino della Società Entomologica Italiana,' tome iii., trimestre 4; by the Society. 'The Canadian Entomologist,' vol. iv., No. 2; by the Editor. 'L'Abeille,' tome viii., livr. 13 and 14; by the Editor.

Election of a Member.

Raphael Meldola, Esq., of the 'Star' Chemical Works, Brentford, was balloted for and elected a member of the Society.

Exhibitions, &c.

Mr. Higgins exhibited a series of magnificent species of Cetoniidæ, from Java.

Mr. Bond exhibited a British specimen of Acronycta leporina, presenting a remarkable instance of dimorphism, the right hand wings being coloured and marked as in the variety known as bradyporina (which at one time was considered a distinct species), whereas those of the left hand were entirely typical of leporina. The body also partook of the two forms, being divided longitudinally into two tints.

Mr. Smith said that the discussion at the last meeting respecting Siberian insects had induced him to examine specimens of the common hornet (*Vespa Crabro*), from Europe, Siberia and North America, and he found that individuals from these districts presented no appreciable differences, and their specific identity was proved by the genital organs being alike in all cases, whereas those of the Asiatic V. orientalis differed considerably.

Mr. Albert Müller read the following notes:—

"*A few words on Serropalpus striatus*, Hellenius.

"At pp. 76—78 of the 'Entomologist's Annual' for 1872, my friend Mr. Rye makes some judicious remarks on the single doubtful British example of this beetle (suggesting that it may have been introduced in Norwegian pine-wood), and points out an error in Grenier's Catalogue, where it is ascribed to an unknown author named 'Hellwing.' I may be permitted to offer some notes on both topics. First, as regards this insect's liability of being transported in pine-wood. Some twelve or fifteen years ago I arduously collected Coleoptera at Basle, where it used to be part of my daily recreation to visit the landing-place of the pine timber floated down the

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Rhine in rafts. The timber was generally dragged ashore and piled up along a low stone wall at the 'Untere Rheinweg.' Between the wall and the trunks sufficient space was left for a man to get along. I soon found out that the wall thus shaded from the glare of the sun formed a retreat for lots of 'good things' coleopterologically speaking. Hence I got into the habit of inspecting it closely and regularly. One hot afternoon in summer I caught sight of a dozing creature I had never seen before; it looked like one of the Elateridæ, and yet there was something uncanny about its facies, which did not tally with what I knew of that group. While thus speculating, I must involuntarily have breathed on the beetle, because suddenly it dropped to the ground and began to shuffle along very rapidly in a peculiar jerking and rolling fashion, reminding me vividly of the awkward but rapid motion of a Mordella. Then of course I pounced down upon it, and once safely in the spirit bottle its palpi and a look at the breast showed me that I had captured Serropalpus striatus, the only specimen I ever saw alive. Many years afterwards, on the 13th of July, 1869, my friend Mr. H. Knecht took another specimen, while crossing the Rhine on a ferry a few hundred yards above the spot where mine was captured. The path of that ferry is daily crossed by hundreds of pine-rafts. Thus we have here two instances of Serropalpus occurring, one at a distance of two feet from a pile of fir-timber, and both in the immediate vicinity of the route of numerous pine-rafts. I am not aware that other specimens have recently been taken at or near Basle; on the other hand I have to state that the same friend has informed me since, that in the summer of 1871, Mr. Erné took at Mulhouse, in Alsatia, about two hundred examples, but whether from growing firs, or dead, decorticated trees, I am not told. It should, however, be stated, that Mulhouse is one of the chief depôts of the timber trade, and draws its supplies through the canal branching off at Huningne, just below Basle. The insect, although usually fir-loving, is, however, not confined to resinous trees, as Abbate Giuseppe Stabile took it at Macugnaga in Switzerland, off alders (Alnus). Secondly, a word as to how the curious blunder 'Hellwing,' may have originated in M. Grenier's 'Catalogue.' Of course to turn up an entomological author of the name 'Hellwing' would now be almost as interesting as finding some more Serropalpi in a bundle of hose at Leicester (Ent. Annual, 1872, p. 76), but we all know that there lived once a Pomeranian entomologist, J. Ch. L. Hellwig, who created the genus Hallomenus, used among others by Illiger and Panzer, and that this genus Hallomenus, of Hellwig, contains even now the next of kin of Serropalpus striatus of Hellenius. When, therefore, a French author meets in a German work with a genus Hallomenus, of Hellwig (usually abbreviated Hellw.), and next to it he has to place a genus Serropalpus of the Swede Hellenius (usually abbreviated Hellen.), surely some allowance may be made for the 'printer's devil.' It is, however, amusing to see that precisely the

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same mistake can be pointed out in the catalogues of authors whose native language is German; and lest it should be thought that I want to make undue propaganda for either Teuton or Gaul, I abstain from mentioning either, but confine myself to the case of a neutral Swiss, the late J. J. Bremi, in whose 'Catalog der Schweiz. Coleopteren,' 1856, we find, at p. 38, Serropalpus striatus, Hellw., instead of Hellen.! Bremi, however, agreed with Mr. Rye in his view of the rights of priority of Schaller's name 'barbatus,' and sinks 'striatus,' *Hellw.* (*sic!*) as a synonym. Herein he is wisely followed by Dr. Stierlin, but of course the latter quotes correctly, 'striatus,' *Hellen.* (Fauna Coleopterorum Helvetica, 1867, p. 225). The late Dr. Schaum followed the opposite course in his 'Cat. Col. Europæ,' but his reasons I know not; can any German friend enlighten me?"

The Secretary read an extract from the 'South Australian Register' for January 2, 1872, forwarded by Mr. C. A. Wilson, respecting the recent ravages of locusts in that colony. The more important observations were as follows:—

"Some of the farmers in the North appear to have suffered very seriously from the swarms of locusts that have suddenly made their appearance there, and during the past three weeks the papers have been full of letters, paragraphs and articles upon the scourge, which have traversed the colony in force from the north, and attacked Adelaide in their march southward. As the subject is one of deep interest to every tiller of the soil, we collect the most important items of information and comment for the benefit of our readers. The 'Register,' referring to the subject on December 19, says:—'It will be remembered that in alluding to the locusts in a former issue we requested information as to their ravages. One correspondent has responded to that request, and the facts he furnishes, as published below, show that the duty of victualling for a week or two the hosts of locusts that have billetted themselves upon the city and suburbs is far from a trifling one. The only grain of comfort offered to relieve our minds comes in the shape of a communication from an old colonist, to the effect that the locusts are in the habit of depositing their eggs this month, and that they never long survive this domestic operation. The sooner they set about the preliminaries for their final exit the better. Subjoined is the communication to which reference is made above:—"I observed in the Register's leader this morning that any particulars of ravages done by the locusts would be gladly inserted. Perhaps the following may be worth noticing amongst others, and you may rely upon its correctness, for I write merely what has come under my observation:—Mr. H. Hughes cut two sections of hay (pure wheaten and intended for wheat) about six weeks ago, when quite green, and an excellent crop of green feed followed, which is termed 'second crop.' It was quite thick with young ears on it, and about one foot or one foot and a half

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high. On Saturday it was standing fresh and green, and at three o'clock in the afternoon there was not a stalk left. Mr. Hughes intended turning his cows in to-day, and had been relying upon the ground providing grazing for some time. Having reserved a small portion of the second crop (which was too good to cut for hay) as seed wheat, he had been unable to turn the stock in before, and it had consequently grown without hindrance. The ground containing the second crop destroyed is about sixty or eighty acres. The locusts were about Burnside in immense numbers, and produced quite a humming or buzzing noise in the air as they passed. All seemed to be going S. or S.W. The neighbourhood is still full of them (those left behind), and they are eating every particle of feed down. I am not aware of their having done damage to gardens or standing wheat crops."'

"'Delta,' the well-known naturalist of South Australia, writes thus:—'During the last few weeks these locusts have done more than their average amount of damage at this season of the year, but, judging from past experiences of their migratory habits and times of appearance, I do not think we have more than usual to fear from their depredations this season, except in limited localities. These creatures just now more particularly infesting Adelaide and neighbourhood are genuine locusts.

"'In every year this kind of migratory locust has appeared at some part or other of the colony in a greater or less degree, though perhaps never to such an extent in our metropolis as during the time first mentioned,—the exact year I forget. They were then, and often since, of four distinct species, all flying and mingling together, but not easily distinguished, being nearly similar in size. That spoken of by your correspondent 'Observer'—"female dirty brown, males a bright yellow"—was and has always been by far the most numerous. In all the locust tribe, I believe without an exception, the male is smaller than the female.

"'In every year that I have observed these migrating species at one or other part of the colony, they have in no case been seen in any numbers after the first of January. They seem to die off gradually as the new year approaches; their time is up, their strength exhausted, and perhaps the increasing heat of the weather and decrease of food aid in their destruction. At this time, also, the females finish their egg-laying. As to remedies against their numbers and destructive habits, these have been asked for naturally enough ever since their first appearance, but none can be offered as concerns the mass, nor reasons given why they come more one year than another, or in particular localities. In the earlier days I could suggest but two things, and these applied only to their very partial destruction, first stating that the gradual cultivation and opening up of the soil would tend as much as anything to decrease their numbers, as the eggs (of which each female lays a good many) are deposited about an inch under ground, thus preserving them from the effects of the weather, but not from the action of

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the plough. Of the two remedies (though only to a small extent) above alluded to, the one was keeping a large body of fowls, to assist the insectivorous birds that were always seen in numbers about a homestead, especially at locust time; but in these days of destruction of the smaller birds for sport, or under the mistaken impression that they are all fruit or grain eaters, and are therefore indiscriminately shot down, we must not wonder that insects of many kinds, including injurious ones, will increase, and this I see you also mention. On one of these locust visitations—it might have been in 1858, mentioned in your last article—I observed immense swarms of a kind of bird, a little larger than an English sparrow, hovering like a thick cloud over several of the larger tracts of land where the unwelcome visitors were flying, and soon found that they fed principally, if not solely, on them. The name of the bird I did not learn, as it disappeared with the locusts, as if sent for their especial capture. The other partial remedy I mentioned at the time, and which had been previously told me by a friend, was the same as your correspondent 'Observer' speaks of, *viz.*, the leaves of the castor-oil plant, just for the purpose, as he says, of protecting flowers, &c., in a garden. In past years I have frequently tried this, and always found it succeed best when the leaves were fresh. The locusts in their flight descended on them, as on everything else of a vegetable nature, and died after the first few bites; more locusts took their places, so that each leaf was nearly covered with dead bodies, others lying all around who had only strength left to crawl a few paces off, so quickly did the poisonous effects of the sap of the leaf act.

"'Our reference to locusts last week were confined to the Northern Districts, and they occasioned very little notice in Adelaide; but since that the townspeople have had ocular proof of the kind of plague that the Northern farmers suffered from. On Friday evening, December 15, an enormous swarm of locusts passed over the city, darkening the air, and creating no little sensation. It appears that for some time they had been steadily marching—if the kind of locomotion affected by them can be called "upon a march"—upon the metropolis. We have no positive proof of the fact, but it is more than probable that the army mentioned before as having reached Kapunda, and as being *en route* for Gawler, is identical with that to which we are now referring. It was seen approaching the city by Mr. Badge, who on Friday, whilst about three-quarters of a mile beyond Athelstone, encountered a swarm of locusts so thick that his horse refused to face it at a faster pace than a walk. The rider had to cover his head to save himself from injury by their striking him. They were making their way towards Adelaide, passing in solid phalanx towards the south-west. A few stragglers remained in the squares and streets, apparently too much fatigued to continue the advance, but the main body kept standing or covering a space extending over many hundred yards in length and many yards in breadth.

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The citizens flocked out from their houses to witness the unusual sight, and examined with interest the solitary locusts that remained behind. They appeared to be of the ordinary type, but of large size and wonderfully strong in the wing. Another huge swarm of locusts visited the city on Sunday, December 17, alighting in various parts of the Park Lands and in private gardens, where in a very short time they left marks of their voracity upon vines, fruit trees, and other specimens of vegetation. A day or two afterwards Mr. Townsend, of Rundle Street, showed us a basket of apricots, or rather stones, to give an idea of the devastation the locusts had caused among some of the gardens at Glynde and in the Torrens Valley. He states that on many trees of American plums there is not a vestige of fruit left, the invading hordes having thoroughly bared the orchards. We have also seen a bunch of potato-tops and a sample of maize, taken from splendid growths in Mr. O. Philp's garden, Chain of Ponds. At ten or eleven o'clock o'clock on Monday there was not a solitary specimen of the pest about, but soon after countless myriads arrived, and descended upon a splendid patch of potatoes, varying their diet with other green things. It is rather remarkable, but it is vouched for, that the locusts do not touch thistles. Standing upright in the midst of farmsteads and along the river-bank, where clouds of the creatures have gorged themselves, may be seen splendid samples of the much-abused thistle flourishing while dreariness reigns around. All these are very much like the doings of the locusts of 1844; for we find in the old file already referred to the following paragraph:—"During the last few days North Adelaide has been visited by swarms of destructive locusts. In the gardens at the back of Kermode Street they have made great havoc, clearing the vines of their leaves, and eating up the melons and everything else that is green. On Monday the whole neighbourhood was alive with them, their constant fluttering in the air not being unlike the flakes of a heavy snowstorm. Last year they did much damage in this particular locality, but this year their numbers are greatly increased."' —'*Register*,' *November* 13, 1844.

"On Friday, December 17, about sundown, there was an immense flight of locusts at Glenelg from the seaward. They were in countless myriads, and flying about nine or ten feet high. They had every appearance of having crossed the Gulf; at least, they were in full force at the end of the jetty, and appeared to be making their way, against the wind, towards the hills. One of the Glenelg fishermen states that he has on previous occasions seen locusts crossing the Gulf, and that he has, while out at sea, found his boat covered with them. A few days afterwards (December 20) the locusts arrived in force at Glenelg, travelling rapidly southward. The right wing of the army rested on the coast line, but did not go further westward than the green herbage of the sandhills. On the bare sands only a few stragglers were to be seen, and scarcely any within three or four yards of the water.

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Swarms alighted upon various patches of vegetation; one of couch-grass, we heard of, over which the locusts settled two deep, and were killed wholesale with whips. They attacked less zealously a small plantation of lucerne, the flavour of which seemed hardly to their taste. Near it a number of fowls collected, and seemed to be well employed in picking up specimens of Natural History. Mr. George H. Glover writes the following from Kersbrook on the 19th December:—'The locusts were first seen in this neighbourhood on Friday last; they still increased in what we would now call small numbers, for at about eleven o'clock yesterday morning (Monday, the 18th) they began to come in clouds, or rather in one continual cloud. The work of destruction was then commenced in earnest. In a very short time acres and acres of potatoes were cleared of their leaves; the ground, grass, potatoes, and fruit-trees from the bottom to the tops are literally covered with them: they are so thick that we have enough to do to go through the gardens where there is anything green. The first things they eat most are potato-tops, and reeds and grass. Of course I shall be able to tell more about it in a few days. Their direction here is from north-west to south-east.' Some anxiety has been shown as to the extent of the ravages in Dr. Schomburgk's domain of the marauding armies of locusts; but it is gratifying to learn that, while verbenas and some dainty flowers have fared badly, the gardens as a whole have not suffered much. The bulk of the leafage of shrubs and ornamental trees would probably have been cleared but for the pasture-land which adjoins the pleasure-ground, and the plots of couch and other grasses that have been so tastefully laid out. On these spots the hordes settled in myriads, and in many places nothing remains but the bare brown earth and a few tussocks where there was formerly a fine bright green sward, soft as velvet and refreshing to the eye. The pests swept over the grass and ate it far closer than sheep would have done. The Director is yet thankful that this satisfied them, and the locusts in consequence spared what was of vastly more value. Well watering the plots will restore the artificial grasses, and ere long a fresh crop will spring.

"Other colonies as well as our own have been suffering from a similar visitation. From Echuca we hear that incalculable mischief has been done to the standing crops in the district; but the local paper adds:—'It may be useful to agriculturists to learn that the larkspur is exceedingly fatal to these insects. They may be seen lying dead in heaps in gardens where this plant is cultivated.'

"Mr. M. Symonds Clark, in a letter to the 'Register,' writes:—'Of birds which destroy locusts we have a great many species. A very old colonist has informed me that quail were formerly very abundant upon the Adelaide Plains, and that on examining the crops of some of these birds which he had shot he found them to be full of grasshoppers. Probably hawks of all kinds, crows, native magpies, shrikes, laughing jackasses,

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kingfishers, plover, landrail, swans, geese, and nearly all game birds, together with many of the small birds, lend their aid in checking the increase of the locusts. How advisable is it, therefore, that the wanton destruction of these birds should be put a stop to.'"

Mr. Horne related some of his experiences concerning locusts in India, the species being probably Acrydium peregrinum. Their numbers were such that they could often be collected by tons, and they were fed upon by almost every description of animal, including cows, camels, goats, &c.; and they were also eaten, when cooked, by man; he had himself partaken of them. The castor-oil plant certainly had no injurious effect upon the Indian species, though they evidently suffered from the leaves of the tamarind-tree, which acted as a purgative to such a degree, that the surface of the ground beneath one of these trees attacked by them, had often more than an inch deep of their droppings accumulated upon it.

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1 April, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Dr. A. S. Packard, jun., of Salem, U.S.A., was present as a Visitor.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 132; presented by the Society. 'The Entomologist's Monthly Magazine,' for April; by the Editors. 'Lepidoptera Exotica,' part 12; by E. W. Janson. 'The Journal of the Quekett Microscopical Club,' No. 18; by the Club.

Exhibitions, &c.

Prof. Westwood exhibited a large woody gall found at the foot of a young oak tree, from which the gall-flies were then escaping (Mr. Albert Müller considered it to be the work of Cynips Q-radicis). He also exhibited drawings made under the microscope, from microscopic slides prepared by Mr. Whitmarsh, of Wilton, near Salisbury, of various species of Cynipidæ mounted in Canada balsam. Among these were both sexes of the species forming the artichoke-gall of the oak; the males with fifteen, and the females with fourteen, joints to the antennæ. The female of the hard globular gall at the tips of oak-shoots had thirteen joints to the antennæ; the hind wing, close to the pterostigmatical region, was furnished with four long slender hooks, bent at right angles in the middle, connecting the wings during flight; the ovipositor and its two spicula were long, curved, and

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very slender; the terminal ventral segment of the abdomen in this, and in other species of the family, is produced into two compressed lobes at its apex, between which the tips of the ovipositor and its sheaths are placed. The structure of these lobes, as exhibited in the drawings, presented various modifications not hitherto noticed or described, and which Prof. Westwood was of opinion would be of much service in specific determination in the group. He further exhibited similar preparations of various species of fleas. The antennæ of both sexes of Pulex vespertilionis, those of a female flea from the nest of a Parus, &c., were beautifully serrated. The head of a cat's flea showed a series of very strong bent spines on either side of the mouth-organs. The genital organs of a male of Pulex irritans showed a very complicated structure, the spermatic vessels being extremely long and convoluted. Finally, he exhibited drawings of a species of Coccophagus, a genus of minute parasites of the family Chalcididæ, which attacks the Coccus found on the rind of oranges; the male, just hatched, had been sent to him on the preceding day by J. W. Gooch, Esq., of Eton, accompanied by the following letter:—"Some time since I sent you a sketch of an insect I had frequently seen in the interior of the Coccus of the orange. This you kindly told me pertained to your genus Coccophagus. The other morning, when watching the movements of the insect *in situ*, I saw it commence to eat a hole through the skin and covering of the Coccus, and gradually work its body free. As you asked me for a specimen of the perfect insect, I send you one, which I have obtained after five years' search. It seems the most beautiful object I think I ever saw. I have now had it for four days in the accompanying glass cell, and find the best method of illuminating it for microscopic examination is by means of the parabolic condenser, or spot-lens, and then, under a half-inch power, it certainly strikes me as most exquisite."

Mr. Jenner Weir was glad to find the microscope being now so much brought to the aid of entomological investigation, and remarked on the uncertainty attending the description of the objectives used, inasmuch as the same nominal powers varied immensely in results according to the makers of the glasses.

Papers read, &c.

Mr. Albert Müller read the following notes concerning the habits of Anaspis maculata, *Fourc.*:—

"A short time ago Mr. George Norman kindly sent to me, at my request, some large, woody, tumour-like excrescences on birch, from Forres, because I had a notion they might be caused by insect-agency. I am none the wiser as regards their origin even now, but having taken the precaution of consigning them to a separate glass jar, an unexpected little scrap of beetle history has turned up. On the 28th of February last I noticed that a

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whitish, cylindrical, thirteen-jointed, coleopterous larva, six millimètres in length, had dropped from one of these excrescences.

"Turning over the plates of Chapuis et Candéze's 'Catalogue des larves des Coléoptères,' I met with its counterpart on plate vii., fig. 5, copied as being that of Anaspis maculata, *Fourc.*, from a paper by Perris in the 'Ann. de la Soc. Ent. de France,' t. v. 2me Sér., 1847, pl. 1. Not having at that moment the 'Annales' to refer to, and the 'Catalogue' only affording the reference *pur et simple*, I jotted down a description and then left the larva alone. Six days later it had turned to a sculptured pupa four millimètres in length, of a dirty white colour, with the head bent forward on the chest, extremely short semi-detached wing-cases, and a pointed hind-body, from which the cast larval skin was dangling. Breathed upon once it manifested its sense of the annoyance by a series of vigorous tail-lashings to and fro. It then appeared that its hind-body was fringed with detached white silky bristles, and that a few such were also scattered over the other parts of its body. On the morning of the 17th of March I found the empty pupa-skin shrivelled up, and at a short distance the beetle crouching against the rim of the glass in the characteristic sneaking fashion of the Mordellonæ. It proved to be Anaspis maculata, *Fourc.*, as expected. Having since referred to Perris's paper, I find he has given such ample details of the larval state that I deem it useless to reproduce my description, as it tallies in every particular. Perris mentions that the larvæ, pupæ and imagines are found in France in irregular worm-eaten galleries of dead shoots of the wild and cultivated grape vine. At this season of the year the insect, as is well known, is common on all sorts of shrubs and herbs in blossom, particularly on thorns, and it is very likely that the female deposits her eggs indifferently in all sorts of ligneous plants."

Mr. Butler read "Translations of descriptions of certain Pericopides omitted in a list of species recently read before this Society."

Mr. M'Lachlan read a paper "On the external sexual apparatus of the male of the genus Acentropus," supplementing the memoir on the genus by Mr. Dunning, read at the meeting on the 4th of March. He detailed the structure of this apparatus as observed under a ⅔-inch objective, with the compound microscope, and exhibited drawings illustrating his remarks. After cursorily alluding to the question of the ordinal position of the genus, and observing that those entomologists who doubted its Lepidopterous nature could not have studied the structure of the insect, or else maintained an affected opposition, he entered into the subject with regard to the presumed existence of more than one species, and stated that, although minute differences existed in the genital organs of individuals from various parts of England and the Continent, he saw nothing to convince him of the multiplicity of species some entomologists admit. Nevertheless he reserved an

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opinion on the specific value of the great discrepancy in the alar development of the females, over which there hung a certain amount of mystery, and on the obvious fact that the males, from different localities, also varied in the contour of the fore wings.

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6 May, 1872.

H. T. Stainton, Esq., F.R.S., Vice-President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 133; presented by the Society. 'Verhandlungen der k. k. zoologisch-botanischen Gesellschaft in Wien,' vol. xxi.; by the Society. 'The Canadian Entomologist,' vol. iv., No. 3; by the Editor. 'Exotic Butterflies,' part 82; by W. W. Saunders, Esq. 'L'Abeille,' livr. 3, 4 & 5; by the Editor. 'The Entomologist's Monthly Magazine' for May; by the Editors. Newman's 'Entomologist' and 'The Zoologist' for April and May; by the Editor. 'Notice sur divers Lépidoptères du Musée de Genève,' par M. A. Guenée; by the Author.

By purchase:—Gemminger and von Harold, 'Catalogus Coleopterorum,' tome viii., pt. 2.

Election of Members.

The following gentlemen were balloted for and elected:—Lieut. H. Murray, 104th Fusiliers, as an Ordinary Member; and J. Eardley Mason, Esq. of Alford, Lincolnshire, as an Annual Subscriber.

Exhibitions.

Mr. Edward Saunders exhibited a series of species of Australian Buprestidæ, illustrating the sexual differences existing in these insects, the male in all cases being much smaller than the female.

Mr. F. Smith exhibited a large collection of Hymenoptera, chiefly Aculeata, sent from Japan by Mr. G. Lewis. The collection was strikingly European in its aspect, and, with the exception of one genus of ants, all the genera were European. The genera represented were Camponotus, Tapinoma, Polyrhachis, Ponera, Formica, Tiphia (four species), Mutilla (one species only), Scolia, Pompilus (allied to a North-American form), Ammophila, Sphex, Bembex, Vespa, Sphecodes, Nomada, Cœlioxys and Halictus. Some of the species appeared to be identical with European forms, such as Camponotus pubescens and ligniperdus and Sphex argentata. Among the Tenthredinidæ the genus Hylotoma was represented by six

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species, all probably new; and there was also a species of Sirex extremely like S. gigas, but differing from it in the constricted base of the abdomen. The collection was sent from Hiogo.

Mr. Verrall exhibited a specimen of Syrphus lasiophthalmus with a peculiar malformation of tibia and tarsus, those members appearing as if they had been broken and badly united afterwards. He considered it was due to an injury received just after the insect had emerged from the puparium, when the parts were soft.

Mr. M'Lachlan remarked that he had observed an analogous malformation in a sawfly (Hylotoma fasciata). See Proc. Ent. Soc. 1867, p. xcix.

Mr. Stainton exhibited an aspen-leaf sent by Lord Walsingham from Fort Klamath, Oregon, pierced by a multitude of small oval holes, each indicating the place where a small mining Micro-Lepidopterous larva of the genus Aspidisca had cut out its case when full fed. He had figured a smaller leaf so attacked on the cover of the 'Entomologist's Annual' for 1872. He also exhibited living and dead examples of the perfect insect bred from cases sent to him by post by Lord Walsingham.

Papers read.

Mr. Edward Saunders read "Descriptions of twenty new species of Buprestidæ."

Mr. H. W. Bates read a memoir "On the Longicorn Coleoptera of Chontales, Nicaragua," chiefly drawn up from materials collected by Mr. Thomas Belt near the mining village of Santo Domingo, in lat. 12° 16′ N., long. 84° 59′ W., nearly midway between the Atlantic and Pacific Oceans, in the forest region of the lower levels. Of the 242 species enumerated 133 were peculiar to Chontales, 38 were found also in Mexico, 5 also in the West Indian Islands, 5 also in the United States, 24 also in New Granada and Venezuela, 22 also in the Amazon Region, 10 also in South Brazil, and 5 were generally distributed in tropical America. Of 129 genera among which the species were distributed, only 7 were found also in the Old World, but 95 were universally distributed in tropical America. An analysis of these materials elicited two general facts of much interest: *firstly*, the homogeneity of the type of the insect fauna of the forest region of tropical America, extending over probably 45 degrees of latitude; *secondly*, the existence of a distinct northern element whose metropolis is Central America. The author strongly condemned crude attempts at generalization, such as were exhibited in some recently-published papers on the geographical distribution of Coleoptera, because in nearly all cases they were based upon insufficient evidence, and were untrustworthy on account of the uncertainty of the true generic position of the materials.

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3 June, 1872.

Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Iconographie et Description des Chenilles et Lépidoptères' inédits par M. P. Millière, tome i., ii., iii., livr. 24—27; 'Die Schmetterlinge Deutschlands und der Schweiz systematisch bearbeitet von H. v. Heinemann, erste Abth., Gross-schmetterlinge; Zweite Abth., Kleinschmetterlinge,' tome i., ii., Heft i.; 'Notiser ur Sällskapets pro Fauna et Flora Fennica Förhandlingar,' t. ii., iii., ix., x., xi.; 'An Illustrated Natural History of British Butterflies,' by Edward Newman, F.L.S., &c.; 'The Cabinet List of the Lepidoptera of Great Britain and Ireland,' by H. Guard Knaggs, M.D., &c., the Tineina being elaborated by H. T. Stainton, Esq., F.R.S., &c.: 'The Lepidopterist's Guide,' by H. Guard Knaggs, M.D., &c.; presented by J. W. Dunning, Esq. 'Annales de la Société Entomologique de France,' 5e Série, tome i.; by the Society. 'Berliner entomologische Zeitschrift,' 1871, Heft. 2, 3; 1872, Heft. 1; by the Society. 'The Canadian Entomologist,' vol. iv., No. 4; by the Editor. 'L'Abeille,' 1872, livr. 6 & 7; by the Editor. 'Fourth Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri, made to the State Board of Agriculture, pursuant to an appropriation for this purpose from the Legislature of the State,' by Charles V. Riley, State Entomologist; by the Author. 'Proceedings of the Scientific Meetings of the Zoological Society of London,' 1871, parts ii. & iii.; by the Society. 'Proceedings of the Royal Society,' No. 134; by the Society. 'Bullettino della Società Entomologica Italiana,' iv., trim i.; by the Society. 'Report of the Entomological Society of the Province of Ontario, for the year 1871;' by the Society. 'The Zoologist' for June; 'Newman's Entomologist' for June; by the Editor. 'The Entomologist's Monthly Magazine' for June; by the Editors. 'A Discussion of the Law of Priority in Entomological Nomenclature; with Strictures on its Modern Application; and a Proposal for the rejection of all disused Names,' by W. Arnold Lewis, F.L.S., M. Entom. Soc. Lond., Barrister-at-Law; by the Author. 'Notes on some Arachnida collected by Cuthbert Collingwood, Esq., M.D., during Rambles in the China Sea, &c.; 'Descriptions of some British Spiders new to Science; with a notice of others, of which some are now for the first time recorded as British Species;' by the Author, the Rev. O. P.-Cambridge. 'Contributions pour servir à l'histoire-naturelle des Ephémérines,' two pamphlets; by the Author, M. le Dr. Emile Joly.

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Exhibitions, &c.

Mr. Stainton exhibited a twig of cork-oak (*Quercus suber*) from Cannes, placed in his hands by Mr. Moggridge, bearing examples of a large black, berry-like Coccus.

Prof. Westwood exhibited a cotton-like mass enveloping the cocoons of a minute parasitic hymenopterous insect of the genus Microgaster, which infested the caterpillar of some large species of Bombycidæ in Ceylon. The mass was the product of the parasites of a single larva. He had extracted therefrom 717 of the parasites, and, as many more remained, there could be little doubt but that about 1000 of these insects had been nourished within this single caterpillar.

Mr. F. Moore stated that he had observed a similar occurrence in a larva of a species of Odonestis from Bombay.

Prof. Westwood also exhibited an apple-twig, the buds of which were destroyed by some small larva, apparently pertaining to the Tortricidæ. The outside of the twig was much blackened, and he thought this had some connection with the presence of the larvæ.

Mr. Stainton observed that the larva of Laverna atra fed within the shoots of apple, but he could not say that the twig exhibited was infested by that species.

Mr. Stainton exhibited a drawing of a vine-leaf mined by the larva of Antispila Rivillei, and a bred specimen of the perfect insect, which had appeared on the 23rd of May last. He prefaced the exhibition with the following remarks:—

"The exhibition I am about to make is in many respects the most interesting I shall ever make in the course of my life; it seems to border upon the domain of prehistoric Entomology: we must go back, before the appearance of the first volume of De Geer's Memoirs, to a period little later than the conclusion of Reaumur's Memoirs, to find the last previous notice of the existence of this insect. That notice, in the form of a letter from Godeheu de Riville, a Knight of Malta, to the illustrious Reaumur, was printed *in extenso* in the first volume of the 'Mémoires de Mathématique et de Physique, présentés à l'Academie Royale des Sciences' in 1750. A translation of this notice by Goeze appeared in 1755 in the fourth volume of the 'Naturforscher,' and Fuessly, who reproduced many of Goeze's notes on Lepidoptera in the second volume of his Magazine, in 1779, also repeated the notice of this insect.

"A period of seventy-five years then elapsed before any further printed notice appears having reference to this species, and it will be necessary therefore to point out the successive steps which have contributed to its rediscovery.

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"In 1853, at the September meeting of this Society, Mr. Douglas exhibited some curious Lepidopterous larvæ mining in the leaves of dogwood; they were entirely apodal, and when full fed cut out oval cases from the mined blotches, and descended to the ground.

"In 1854, at the June meeting of this Society, Mr. Thomas Boyd exhibited the moth bred from the dogwood larvæ: it was Elachista Treitschkiella, a species first made known to us on the last plate of Fischer von Röslerstamm's beautiful work published in 1842.

"In October, 1854, I brought before this Society a short paper, in which I called attention to the perfect identity of habit of the vine-leaf miner recorded in 1750 and the dogwood miner lately bred, and, with the view of giving an impetus to the rediscovery of the vine-leaf miner, I proposed for it a name, Elachista Rivillei. At that time we had begun to consider these insects as abnormal Elachistæ; but it was Herrich-Schäffer who erected a separate genus for their reception—Antispila.

"In 1855, when visiting Paris for the first time, I brought the subject before the French Entomological Society, and gave a figure in the 'Annales' of the dogwood miner, thinking, as vines were grown so extensively in France, the attention of some French entomologist would thereby be drawn to the insect, and its rediscovery effected. In this, however, I was disappointed, and when Staudinger and Wocke's Catalogue first appeared, in 1861, the existence of my Antispila Rivillei was utterly ignored. There is nothing like a flat contradiction for stimulating a man to try and prove his point, and I must say I felt more determined than ever the insect should be found. Curiously enough, a ray of light came to us from across the Atlantic; for the late Dr. Clemens published, in 1860, in the Proceedings of the Academy of Natural Sciences of Philadelphia, notices of two species of the genus Antispila, of which he had found the larvæ in the leaves of vines.

"In 1869, in my volume on the Tineina of Southern Europe, I devoted an entire chapter to the history of this insect, and reproduced the original plate which had been published in 1750.

"In October, 1871, I received some of the larvæ of this insect from Massa di Carrara: these were sent me by Lady Walsingham, having been found by her daughter, the Hon. Beatrice de Grey; it was from the larvæ then received that the figure of the mined vine-leaf I exhibit was made.

"In April, 1872, I heard from Lady Walsingham that a specimen of the perfect insect had emerged from the pupa, which gave me an indication to expect specimens myself shortly, for my pupæ had not had the advantage of spending a winter in Italy. On the 23rd of May the first specimen appeared: this I now exhibit: it is much smaller than Treitschkiella, and I am sorry to say that a second specimen, which appeared yesterday, is considerably smaller than this."

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Mr. Higgins exhibited a series of beautiful species of Cetoniidæ, principally from Java, which he had recently obtained from Dr. Mohniki. The most striking species were as follows:—Pryenia Vollenhoveni, *Mohniki;* Diceros Petelii, *Buquet;* Coryphœna gloriosa, *Mohniki;* Clinteria flavomarginata, *Wiedemann;* Glycyphana picta, *Mohniki;* G. palliata, *Mohniki;* G. albomaculata, *Mohniki;* Eupœcila balteata, *Vollenhoven;* and Cholerastoma spondylidea, *Mohniki.*

Mr. Jenner Weir stated that having recently planted many shrubs, of a variegated form, of Rhamnus alaternus in his garden at Blackheath, they were at once discovered by Gonopteryx rhamni, which deposited its ova upon them. He had not observed this butterfly in his garden for sixteen years, and considered it remarkable that the presence of the Rhamnus should have so soon attracted it, considering that this evergreen species was so totally unlike our two indigenous species in outward appearance.

Mr. M'Lachlan read the following communication which he had received from Prof. Alfred Newton:—

"Did you not long ago ask about birds eating dragonflies? Mr. S. S. Allen ('Ibis,' 1862, p. 360) says that the bottom of the chamber excavated by Merops persicus (ægyptius) was covered with the remains of dragonflies, mostly wings, upon which the eggs were deposited. In the common M. apiaster the eggs are said to be generally laid on handsfull of elytra and legs of Coleoptera, the *rejectamenta* of their meals: doubtless these dragonfly wings are the same, as, a few lines further on, he says he found them made into pellets."

Mr. Müller called attention to the following extract from the 'Times' of the 29th of May, respecting a plague of ants in the Island of May:—

"The Northern Lighthouse Commissioners have had a somewhat curious case presented to them for consideration and investigation. It appears that for some years past the emmets, or ants, have been increasing in number to a most enormous extent on the May Island, the property of the Lighthouse Board, and at present every part of the island is so infested with these little creatures as to render the land useless to the light-keepers. The myriads of insects by their burrowing are also raising considerable hillocks. For the purpose of investigating the matter, with a view to adopt means to exterminate the insects, a party of gentlemen left Edinburgh on Saturday morning, and proceeded from Granton in the 'Pharos' to examine the state of the island. The steamer sailed at 9.30 A. M., and among the gentlemen who embarked were the Lord Provost, Provost Watt, of Leith, Bailie Miller, and Sheriff Fordyce, Commissioners; the professional gentlemen were Professors Sir R. Christison, Stevenson Macadam, Maclagan, Wyville Thomson, &c. Mr. D. Stevenson, engineer to the Board, was also present. When off Crail two

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gentlemen, said to have practical experience in such matters, were received on board, after which the steamer proceeded to the island, where the whole party landed and remained about two hours. The weather was extremely fine, and the sea being smooth there was no difficulty in landing from the boats. The steamer returned to Granton about 8 P. M. The result of the investigation has not yet been made known."

The Secretary read an extract from the 'Petites Nouvelles Entomologiques' of the 1st of June, respecting the occurrence of numbers of Calosoma sycophanta on the body of a man who had hung himself in a forest near Rheims. The corpse being in a state of putrefaction, it was considered probable that the Calosoma had been attracted by the odour, and it was suggested that the bodies of animals suspended in forests might prove traps for this insect.

The President called attention to a communication from M. Guenée, in the same journal, respecting Spilosoma sordida. Having bred a female, he awaited the appearance of a male in order to obtain a brood of larvæ. A male appeared, but it was a variety having the colours of the female, and during three days the sexes showed no desire to pair. At the fourth day a male of the ordinary colour emerged, and copulation took place even before its wings were fully dry. M. Guenée considered it a remarkable instance of the care which Nature exercises to maintain purity of race. But Mr. Stainton thought it more probable that the abnormally coloured male was incapable of continuing the species, and hence was neglected by the female.

Mr. Briggs alluded to the infertility which sometimes exists among insects; for instance, he once failed to obtain fertile eggs from three pairs of Clostera curtula. He further remarked on the intoxicating effects of "sugar" upon Noctuæ, in connection with the reproductive instinct, and observed that those insects when under its influence sometimes disregarded both species and sex in gratifying their amorous propensities.

New Part of 'Transactions.'

Part ii. of the 'Transactions' for 1872 was on the table.

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July 1, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Bulletin de la Société Impériale des Naturalistes de Moscou,' Année 1871, Nos. 3 and 4; presented by the Society. 'Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College,' No. v.; by the Trustees. 'The Canadian Entomologist,' vol. iv., No. 5; by the Editor. 'A Systematic Revision of some of the American Butterflies, with brief notes on those known to occur in Essex County, Mass.," by Samuel H. Scudder; by the Author. 'The Entomologist's Monthly Magazine' for July; by the Editors. 'Lepidoptera Exotica,' part xiii.; by E. W. Janson. 'Notiser ur Sällskapets pro Fauna & Flora Fennica Förhandlingar,' vols i., iv., v., vi., vii. and xii.; by J. W. Dunning, Esq. 'Exotic Butterflies,' part 83; by W. W. Saunders, Esq. 'Notice by the Board of Studies for the Natural Science School of the University of Oxford. Issued in pursuance of Statute Tit. v. (vi.), Sect. i.'; by Professor Westwood.

Election of a Member.

Lord Moreton was balloted for, and elected an ordinary Member.

Exhibitions, &c.

Mr. Jenner Weir exhibited two examples of Agrotera nemoralis, taken by him in Abbot's Wood, Sussex, on the 26th ultimo.

Mr. Meldola exhibited several varieties of British Lepidoptera, including dwarf specimens of Anthocharis cardamines, Porthesia auriflua and Abraxas grossulariata, and a Venilia maculata in which the black spots of the wings were entirely absent; also an example of Leucania vitellina, taken at Brighton in 1869.

Prof. Westwood exhibited various interesting Coleoptera sent from Ceylon by Mr. Thwaites. Also prettily banded cocoons of some species of Ichneumonidæ (likewise sent from Ceylon by the same gentleman) remarkable for being attached to silken threads more than two inches long. The same lot of Ceylonese insects had furnished him, further, with an interesting illustration of the habits of a Lepidopterous insect, the larva of which cut out large oval pieces from a leaf of Citrus, making therewith a moveable dwelling under which it fed, fastening it down by the edges: owing to the

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larva having been infested with Hymenopterous parasites, the determination of the species was frustrated.

Mr. Müller exhibited the mode of life of three species of Dipterous larvæ in the fronds of Pteris aquilina, collected at Weybridge on the 29th ultimo, *viz.*—rolls formed by the larva of Cecidomyia pteridis on the edge of the fronds; mines of some species of Muscidæ in the tips of the leaflets, and a globular tent at the ends of the fronds, also produced by a species of Muscidæ.

Mr. Dunning called attention to an article in 'Nature' for June 20th, 1872, by Mr. H. N. Moseley, concerning the sound produced by Acherontia Atropos. After passing in review the various theories which proposed to account for the production of this sound, Mr. Moseley detailed certain experiments he had made, and arrived at the opinion held by many entomologists that the sound is caused by expiration of air through the proboscis, in connection with certain elevating and depressing muscles in the interior of the head, which act upon a dome-shaped cavity or reservoir, after the manner of bellows.

Mr. Dunning further alluded to a letter by Dr. Le Conte in the same journal for June 27th, 1872, concerning the parasite of the beaver (Platypsylla castoris, *Ritsema;* Platypsyllus castorinus, *Westwood*), upon which Prof. Westwood had founded the order Achreioptera, whereas Ritsema placed it in the sub-order Aphaniptera. Dr. Le Conte stated that, in his opinion, it pertained to the Coleoptera. Furthermore he thought the insect was not truly a parasite, but rather an inquiline, living probably upon epidermal scales. He announced that the Rev. A. Matthews had prepared for him a series of beautiful dissections of the creature.

Prof. Westwood observed that with reference to Dr. Le Conte's remarks on the Coleopterous nature of the genus, he could not recognize it as belonging to the order Coleoptera; and that his detailed illustrations (which he had recently shown to Dr. Le Conte) intended for publication in his forthcoming 'Thesaurus Entomologicus,' had for some time been engraved.

Prof. Westwood called attention to the notice of the Board of Studies for the Natural Science School at Oxford (a copy of which was on the table), as being the first recognition of Zoology as a branch of university education at Oxford. He also alluded to Mr. Scudder's memoir on North-American Rhopalocera, as exhibiting a complete *bouleversement* of generic nomenclature, nearly every species being also formed into a separate genus, with generic characters of sometimes four to six pages in length.

Mr. W. A. Lewis placed before the meeting a copy of the following circular addressed to entomologists, with list of signatures as appended thereto:—

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"*Entomological Nomenclature.*—The undersigned, considering the confusion with which entomological nomenclature is threatened (and from which it is already to no small extent suffering) by the reinstatement of forgotten names to supersede those in universal employment, urge upon entomologists the desirability of ignoring the names so brought forward, until such time as the method of dealing with them shall be settled by a common agreement.

H. W. Bates	Frederick Bond
Alfred R. Wallace	J. Jenner Weir
William C. Hewitson	E. Shepherd
Francis P. Pascoe	Edward W. Janson
T. Vernon Wollaston	Edward Newman
John A. Power	E. T. Higgins
Samuel Stevens	R. F. Logan
Edward Sheppard	J. Greene
Ferdinand Grut	Thomas H. Briggs
J. W. Dunning	W. C. Boyd
Frederic Moore	Howard Vaughan."
W. Arnold Lewis	

Prof. Westwood stated that he had recently published some remarks on the law of priority in nomenclature in the 'Academy'; he considered a law similar to that which limits adverse claims to real property in this country to a period of twenty years, might with equal advantage be applied in Zoology.

November 4, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'The Transactions of the Linnean Society of London,' vol. xxviii. pt. 2; vol. xxix. pt. 1; Proceedings, Session 1871-72; Journal, No. 55; presented by the Society. 'Proceedings of the Royal Society,' Nos. 135, 136 and 137; by the Society. 'Proceedings of the Scientific Meetings of the Zoological Society of London,' 1872, pt. 1; by the Society. 'Bullettino della Società Entomologica Italiana,' iv. trim. 2 & 3; by the Society. 'Mittheilungen der Schweizerischen Entomologischen Gesellschaft,' vol. iii. No. 9; by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1872, No. 1; by the Society. 'The Transactions of the Entomological Society of New South Wales,' vol. ii. pt. 4; by the Society. 'Annales de la Société Linnéenne de Lyon,' N. S. tome xviii.; by the

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Society. 'Annales de la Société d'Agriculture, Histoire Naturelle, et Arts utiles de Lyon,' 4e Série, tomes i. & ii.; by the Society. 'The Journal of the Quekett Microscopical Club,' No. 19; by the Club. 'The Canadian Naturalist,' Nos. 7, 8 and 9; by the Editor. 'L'Abeille, 1872,' livr. 8—12; 'Millière, Iconographie et Description de Chenilles et Lépidoptères inédits,' livr. 28 & 29; by J. W. Dunning, Esq. 'The Entomologist's Monthly Magazine,' for August—November; by the Editors. 'The Zoologist,' for July—November; by the Editor. 'Newman's Entomologist,' for July—November; by the Editor. 'Exotic Butterflies,' part 84; by W. W. Saunders, Esq. 'Lepidoptera Exotica,' part 14; 'Cistula Entomologica,' part 5; by E. W. Janson, Esq. 'On the Revision of the Tenebrionidæ of America north of Mexico'; 'Description of a new Pseudomorpha from California, with Notes on the Pseudomorphidæ'; 'On Amphizoa insolens, *Leconte*'; 'Notes on the Zopheri of the United States'; 'Descriptions of new Genera and Species of Western Scarabæidæ, with Notes on others already known'; 'Catalogue of Coleoptera from South-Western Virginia'; 'New Species of Coleoptera from the Pacific District of the United States'; 'Synopsis of the Parnidæ of the United States'; 'Notes on some Genera of Coprophagous Scarabæidæ of the United States'; 'Contributions to the Coleopterology of the United States'; 'Descriptive Catalogue of the Species of Nebria and Pelophila of the United States'; 'On the Species of Oodes and allied Genera of the United States'; 'Description of the Species of Aphodius and Dialytes of the United States'; 'Descriptions of new Species of Histeridæ of the United States'; 'Synopsis of the Species of Corphyra, *Say*, of the United States'; 'Synopsis of Aphodiini of the United States'; 'Remarks on the Species of the Genus Isomalus, *Er.*, of the United States'; 'Descriptions of new Species of Elateridæ of the United States'; 'Descriptions of new Coleoptera of the United States, with Notes on known Species'; by the Author, G. H. Horn, M.D. 'Remarks on Synonyms of European Spiders,' No. 3; by the Author, T. Thorell. 'Monographie des Graphiptérides'; 'Essai Monographique sur le Genre Abacetus, *Dejean*'; 'Remarques sur le Catalogue de MM. de Harold et Gemminger'; 'Essai Monographique sur les Orthogoniens'; 'Essai Monographique sur les Drimostomides et les Cratocérides, et Description d'un Genre nouveau de Morionides'; by the Author, Baron M. de Chaudoir. 'Matériaux pour une Faune Névroptérologique de l'Asie septentrionale,' par MM. de Sélys-Longchamps et MacLachlan; by the Authors. 'Matériaux pour la Faune Belge,' Deuxième Note, Myriapodes; by the Author, M. Félix Plateau. 'Sulla Fecondazione dell' Ape regina'; 'Esame Critico della Teorie sulla Partenogenesi delle Api'; by the Author, the Rev. Giotto Ulivi. 'Description d'un nouveau Papillon Fossile (*Satyrites Reynesii*), trouvé à Aix en Provence'; by the Author, S. H. Scudder, Esq. 'Phylloxera vastatrix in Portugal'; by the Author, Albert Müller, Esq. 'Observations on a Paper read by Mr. A. Bathgate before the Otago Institute, 11th January, 1870, "On the Lepidoptera of Otago,"' by R. W.

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Fereday, Corresponding Member of the Entomological Society of London; by the Author. 'A Classified Catalogue of the Lepidoptera of Canada'; by the Author, A. M. Rose, M.D. 'Report of the Entomologist and Curator of the Museum, Washington'; by the Author, Townend Glover. 'The Scottish Naturalist,' vol. i.; by the Editor, Dr. F. Buchanan White. 'Stettiner Entomologische Zeitung,' vol. xxxiii. Nos. 4—9; by the Society.

By purchase:—'Terminologia Entomologica. Nach dem neuesten Standpunkte dieser Wissenschaft bearbeitet von Julius Müller.' 'Opuscula Entomologica,' edidet C. G. Thomson; fasc. i.—iv.

Exhibitions, &c.

Mr. S. Stevens exhibited a Pieris Daplidice and six examples of Argynnis Lathonia taken by himself, last September, near Dover; also a dark variety of Pieris napi, which he took at Leenan, Co. Mayo; two varieties, one very fine and rich in colour, of Pyrameis cardui, and a black variety of Callimorpha dominula from Dover; and Sesia asiliformis, Chœrocampa celerio, and Deilephila livornica from Brighton.

Mr. F. Smith exhibited a very large collection of Formicidæ sent by Mr. Rothney from Calcutta. This was especially interesting, inasmuch as, in many cases, all the forms were present, these being often so dissimilar in appearance as to render it certain that if their history was not known they would be placed in separate genera; and this had actually occurred in at least one instance.

Mr. Smith also exhibited, and presented to the Society, the Minute Book of the Meetings of the Entomological Society existing in London from 1806 to 1822, in which were copied the minutes of the pre-existing Aurelian Society. This had been given to him by Dr. J. E. Gray.

The Meeting passed a special vote of thanks to Mr. Smith for this interesting donation to the Society's Library.

Mr. Butler exhibited a remarkably perfect impression of the wing of a fossil butterfly in the Stonesfield slate. It appeared to be most nearly allied to the now-existing South American genus Caligo.

Mr. Davis exhibited a large collection of beautifully preserved larvæ of various insects.

Prof. Westwood exhibited a collection of drawings of the transformations of Indian Lepidoptera (chiefly Heterocera), executed by Major Hunter.

Prof. Westwood further made some remarks on the habits of the common gnat. He had observed none in his house at Oxford till about July; but from then up to the present time there were swarms in certain rooms every night, making their presence known by flying to the lights. All were females, which sex alone is known to torment man by its bites. They were carefully destroyed each day; yet, although both doors and windows were closed, they were daily replaced by a fresh swarm, and he could only account for their presence by supposing they came down the chimneys.

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A letter was read from the Secretary of the Haggerstone Entomological Society, inviting the Members to their annual exhibition of insects on the 14th and 15th inst.

Papers read, &c.

Mr. Müller read the following, and exhibited specimens of the beetle:—

"*Notes on the Habits of Ozognathus cornutus*, Lec.

"On his visit to Europe last year, Mr. Riley, the State Entomologist of Missouri, presented me with a large cynipideous, potato-shaped, polythalamous oak-gall, from California, which I exhibited to this Society on the 6th of November, 1871.

"Mr. Riley proposes the name of Quercus californica for this gall, which he thinks is undescribed, and specimens of which have been seen by Baron von Osten-Sacken and Mr. H. F. Bassett, the leading authorities on American Cynipidæ. The name which the maker of the gall will therefore have to bear will be Cynips californica.

"As the gall in question was riddled by numerous exit-holes, some larger ones (two millimètres in diameter) represented those of the Cynips, while several smaller round ones (one millimètre in diameter), betokened the escape of an insect of a different size. I left it lying on my mantelpiece until the 20th of May last, thinking that nothing further could be bred from it. In this I was agreeably disappointed, as in the morning of the said day a small hillock of yellowish worm-eaten dust underneath an opening in course of formation warned me that the gall was still tenanted by living creatures. Of course the specimen was at once consigned to a glass vessel, and thenceforward watched as often as convenient. In the evening of the same day I observed that the identical hole had assumed the neat circular shape of the smaller sized openings scattered over the surface of the gall, and that a small, black, shining beetle had made its appearance in the vessel. This Coleopteron, I have since been informed by Mr. Riley, to whom I sent two pairs, was first described by Leconte in the Proc. Acad. Sci. Philad. 1859, p. 87, as Anobium cornutum, and subsequently (Ibid, Oct., 1865, p. 226) admitted into his genus Ozognathus; its present name is therefore Ozognathus cornutus, *Lec.* The author observes that "this interesting species was sent me by Mr. Andrew Murray, as having been hatched in great numbers from some galls sent from California." Mr. Riley informs me that the habits and transformations of the species have never been published, that from the identical specimen he gave me he obtained several specimens of the beetle before leaving for Europe in 1871, and that from another specimen of the same gall he has bred others since, and has notes and figures of the adolescent stages. Acting on Mr. Riley's suggestion, I give here the few notes I wrote down while watching the beetle and its companions of both sexes, which continued to appear almost

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daily from the 20th of May up to the 19th of June, 1872, when I counted in all six males and fifteen females. Their ways are entirely those of a true Anobium; they gnaw their neat exit-hole in the same laborious fashion, and often remain at its mouth for a while before quitting it for the first time. If frightened in any way they sham death by drawing up their legs and antennæ; left to themselves they readily take flight, both sexes being provided with ample wings. The lively, cornute males may be seen restlessly crawling over the gall, constantly investigating its woody polished surface by means of their antennæ, and ready to copulate with the females directly the latter have made their appearance. On such occasions a running match takes place between the contending males to get hold of the new comer, and the most resolute male, that is to say the individual which can stand perambulation the longest, effects its purpose. The relative position of the sexes is precisely the same as with Anobium; the male while mounted, strokes the sides of the elytra and the underlying lateral parts of the abdominal segments of the female with its quivering antennæ. The female carries her partner about while copulation lasts, and even takes wing successfully with her burden. By isolating some couples from their restless companions, I have ascertained that this act lasts seldom longer than an hour; in some instances I have seen the males quit their hold after less than half-an-hour. The impregnated females re-enter the gall for the evident purpose of oviposition, but I have not been able to make as yet sure of the latter point. I have observed females make their way rapidly towards the nearest aperture while still carrying their partners, the males being ruthlessly and forcibly deprived of their conjugal rights at the entrance of the burrows, the females dragging themselves into the openings in spite of the counter-efforts of the males, which had no choice but to drop off. I have not seen the males enter the burrows again after their first exit from them, but the females I have noticed to go in and reappear again, though not always through the same tunnel, but I recognized the individuals in question by minute white paint marks, which I had previously applied to their elytra. Two of the beetles outlived a week, the males generally dying after having copulated once: the females seemed to be longer lived; one marked female remained in full vigour for ten days. Their 'frass' consisted of isolated brown snuff-like grains."

The Rev. R. P. Murray communicated the following notes:—

"*On some Variations of Neuration observed in certain Papilionidæ.*

"I beg to lay before the Society a few cases of aberrant neuration which I have lately observed in certain insects in my collection. They occur in four genera, *viz.*, Papilio, Parnassius, Thais, and Synchloë (Butler).

1°. Papilio Cloanthus. In all the specimens I possess (three) I find that the first subcostal nervure anastomoses with the costal nerve. This is also

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the case in 2°, Synchloë Mesentina, these insects thus resembling in this respect the genus Leptalis.

3° and 4°. Parnassius Apollo and Delias. I possess specimens of both these species in which the first and second subcostal nervures coalesce more or less completely. Sometimes the junction is complete; in other cases the veinlets again separate just before the end of the first subcostal.

5°. P. Clodias. In the only specimen of this insect which I possess (a female) there is, in the right-hand lower wing, a transverse nerve running from the first subcostal near its extremity towards the second, which, however, is not quite reached, though both nervures are angulated and drawn towards one another by the additional vein.

6°. Thais Polyxena. In one of my specimens there is a distinct and well-formed prediscoidal cell in the hind wings: in two other cases this cell is faintly indicated. This would seem to be a case of reversion to a former type, and to indicate that Thais is comparatively a modern genus. Its nearest ally is of course Parnassius, but as it also seems to possess a true affinity with Zegris, and so with the Pierinæ, we may perhaps conclude that this last-named group is somewhat less ancient than the Papilioninæ. Before concluding I may be allowed to remark on the affinity between the genera Parnassius and Eurycus, as shown by the females of each being provided with a horny pouch. I have nowhere seen it stated that this appendage was formed by Eurycus, but the fact is probably well known."

Mr. Dunning read a "Note on Atropos and Clothilla, with reference to Mr. W. Arnold Lewis's strictures on Dr. Hagen."

After quoting at length the passage from pp. 54, 55, of Mr. Lewis's 'Discussion of the Law of Priority in Entomological Nomenclature, with Strictures on its Modern Application,' in which Dr. Hagen is said to have been guilty of "astonishing chicanery," and to have described in 1865 an insect as having leather-like winglets, 27-jointed antennæ, and with legs not thickened, which in 1861 he had described as having a bare back, 15-jointed antennæ, and thickened thighs, Mr. Dunning proceeded as follows:—

"The contention is that the Atropos of 1861 is the Clothilla of 1865. Let us see if this be correct. Linné described a certain insect under the name Termes pulsatorium, and subsequent authors unanimously regarded the Linnean name as designating a creature which for the present purpose may be sufficiently described by saying that it is wingless and has seventeen joints to its antennæ. In 1815 Leach founded the genus Atropos; and for fifty years the insect popularly known as the death-watch was known to entomologists as Atropos pulsatoria. When Dr. Hagen compiled his 'Synopsis of the British Psocidæ' (Ent. Ann. 1861, p. 17), it had not occurred to any one to doubt that this creature was the identical species which Linné described as Termes pulsatorium; accordingly we find that, at p. 21, Dr. Hagen gives the well-known insect as the pulsatoria of Linné

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and Stephens. In 1841 Prof. Westwood described another insect under the name Clothilla studiosa, a creature not absolutely wingless, but possessing two short leathery scales or winglets, and having twenty-seven joints to its antennæ. So that in Dr. Hagen's Synopsis of 1861 we have:—

Gen. Atropos.	Gen. Clothilla.
Wings wanting. Antennæ with about 15 joints.	With leathery winglets. Antennæ with about 27 joints.
Sp. *A. pulsatoria.*	Sp. *C. studiosa.*

"Dr. Hagen's 'Synopsis of the Psocina without ocelli' (Ent. Mo. Mag. ii. 121) was published in 1865. By this time he had discovered that the Linnean description of Termes pulsatorium did not accord with the insect which had so long been known as Atropos pulsatoria, and had satisfied himself that Linné had before him the identical species which Westwood afterwards named Clothilla studiosa. That being so, Hagen applies the Linnean name pulsatoria to Westwood's studiosa: the insect which has hitherto been called pulsatoria (and which is the pulsatoria of most authors, though not of Linné) requires a new specific name, and the next oldest is found to be divinatoria of Müller's Prodromus, dating from 1776. So that in Dr. Hagen's Synopsis of 1865 we have:—

Gen. Atropos.	Gen. Clothilla.
Without wings. Antennæ with 17 joints.	Wings rudimentary. Antennæ with 27 joints.
Sp. *A. divinatoria.* (Synon. *A. pulsatoria*, of authors, not of Linné).	Sp. *C. pulsatoria.* (Synon. *C. studiosa*, Westwood).

"That is to say, the insect which in 1861 was called Atropos pulsatoria was in 1865 called Atropos divinatoria; and the insect which in 1861 was called Clothilla studiosa was in 1865 called Clothilla pulsatoria. The specific names are changed, but the Atropos of 1861 is the Atropos of 1865, and the Clothilla of 1861 is the Clothilla of 1865; and instead of 'the same insect being described by Dr. Hagen twice over, on two adjoining pages, with opposite structural characters,' the two descriptions refer to two different insects, whose opposite structural characters, and their consequent generic as well as specific distinctness, were fully recognized by Dr. Hagen in 1861 as in 1865.

"To this extent Mr. Lewis's criticism is well founded. Dr. Hagen in 1861 did describe Clothilla as having the 'legs not thickened,' whilst in 1865 he says of Clothilla 'femora dilated,' just as he says of Atropos 'femora dilated.' Now the dilatation of the femora in Atropos is very prominent; in Clothilla it is so slight as scarcely to deserve the name; the thickening or absence of thickening of the thighs is a patent distinction

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between the two genera; and I cannot but believe that there is an unfortunate omission of the negative in Ent. Mo. Mag. ii. 122, and that the description of Clothilla ought to have been 'femora *not* dilated,' in contradistinction to the 'femora dilated' of Atropos. So far from its being the fact, as suggested by Mr. Lewis, that the alteration from the description of 1861 was designedly made in order to admit the Linnean pulsatoria into Clothilla, Dr. Hagen's view is that the insect with the dilated femora is not the Linnean pulsatoria at all, but that the Linnean pulsatoria is Westwood's studiosa, with the legs not thickened."

After referring to another discrepancy between the descriptions of 1861 and 1865, not mentioned by Mr. Lewis—namely, that the "eyes yellowish" of A. pulsatoria in 1861 become "eyes black" in the description of A. divinatoria in 1865—and pointing out that the "eyes yellowish" was a mistake, perhaps taken (blindly) from the Linnean *oculi flavi*, Mr. Dunning observed that, though the synonymy was not given at length in Ent. Mo. Mag., vol. ii., Dr. Hagen did say in so many words that A. divinatoria "is A. pulsatoria of Westwood and authors" other than Linné, *i. e.* the A. pulsatoria of Ent. Ann. 1861, and that C. pulsatoria "is apparently the true Termes pulsatorium of Linné, C. studiosa of Westwood," *i. e.* the C. studiosa of Ent. Ann. 1861. Thus Dr. Hagen himself plainly pointed out which insect he intended by each description,—pointed out, in short, that, notwithstanding the change of the specific names, notwithstanding any variations in the descriptions, the Atropos and Clothilla of 1865 were respectively the Atropos and Clothilla of 1861. And if any doubt could still be felt on the subject, it would be removed by a perusal of Dr. Hagen's later papers in Stett. Ent. Zeit. 1866, pp. 188 and 233, and Verh. zool.-bot. Gesells. in Wien, 1866, p. 201.

The writer then proceeded to say that he was at a loss to conceive how Mr. Lewis could have fallen into the mistake of supposing that the Atropos of 1861 was the Clothilla of 1865. "The head and front of Dr. Hagen's offending is, that he has substituted another name for pulsatoria, that (Atropos) pulsatoria has been superseded; in other words, that the pulsatoria of 1865 is not the pulsatoria of 1861. Mr. Lewis's complaint has its foundation in the facts that the (Atropos) pulsatoria of 1861 is called (Atropos) divinatoria in 1865, and that the (Clothilla) pulsatoria of 1865 is not the (Atropos) pulsatoria of 1861. Yet we are told that the Atropos of 1861 is the Clothilla of 1865! If this were really so, the pulsatoria of 1865 would be the pulsatoria of 1861, Dr. Hagen would be calling by the Linnean name that which he is now satisfied is not the Linnean insect, and Mr. Lewis might have cited him as (in practice, if not in theory) a supporter of *Communis error!*"

In conclusion, Mr. Dunning remarked that he had purposely abstained from discussing the correctness of Dr. Hagen's determination of the Linnean species or the propriety of the change of nomenclature which Dr. Hagen

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introduced. His only object was to show that our Honorary Member, who was not present to defend himself, had not in fact done that which Mr. Lewis supposed him to have done.

New Part of the proposed General Catalogue of British Insects.

A further portion of this Catalogue, comprising the Chrysididæ, Ichneumonidæ, Braconidæ and Evaniidæ, compiled by the Rev. T. A. Marshall, was on the table; and remarks thereon, by Mr. Marshall, were read.

New Part of 'Transactions.'

Part iii. of the 'Transactions' for 1872, published in August, was on the table.

November 18, 1872.

H. W. Bates, Esq., F.L.S., &c., in the chair.

Election of a Subscriber.

Noah Greening, Esq. of Warrington, was balloted for, and elected.

Exhibitions, &c.

Mr. S. Stevens exhibited an example of Vanessa Antiopa captured by Mr. Hewitson, at Weybridge, on the 1st instant.

Mr. Howard Vaughan exhibited Crambus verellus, a species recently detected as British, captured by Mr. C. A. Briggs at Folkestone, in July; and he stated that he had seen two other British examples in the collections of Mr. S. Stevens and Mr. H. R. Cox respectively. He also exhibited varieties of Pyrameis cardui and Vanessa Atalanta.

Mr. Meek exhibited Nephopteryx argyrella, a species of Phycidæ not in the British Lists, which he said had been captured by Mr. Button near Gravesend; also varieties of Arctia caja and other Lepidoptera.

The Secretary read a letter received from Mr. A. R. Wallace, enclosing exuviæ of some insect that had been causing ravages in the collection of South American mosses and lichens collected by Dr. Spruce. The exuviæ appeared to pertain to some species of Tineina.

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Mr. Meldola exhibited a drawing of the dark variety of the larva of Acherontia Atropos.

Papers read, &c.

Mr. Müller read the following:—

"Having lately drawn up, for my own use, a list of the entomological notices contained in the 'Verhandlungen der Schweizerischen Naturforschenden Gesellschaft,' from 1823 to 1864, as given by its Quæstor, in his history of the said Society,* I here communicate this extract for the convenience of entomologists generally. A certain number of these short papers are of more than local interest, while we look in vain for for their complete enumeration in Percheron's and Hagen's bibliographical works, as well as in the German 'Berichte.' It is very likely that other Entomologica may occur in these Annual Proceedings under non-entomological titles. If I should meet with any such matter of value, I shall revert to the subject on a future occasion. As regards the years 1840 to 1845, Prof. von Siebold has given a *résumé* of the entomological proceedings at the annual meetings of this General Swiss Nat. Hist. Society, accompanied by extracts from the proceedings of the various cantonal societies.† I am not aware of any such published digests for the other years.

"The notices which I have not been able to find in Dr. Hagen's comprehensive and meritorious 'Bibliotheca Entomologica' are marked thus (*). Whoever may have the opportunity of searching the publications of the Cantonal Societies of Switzerland will no doubt meet with more.

Bollino, *Sulla malattia dei bachi; 1860, p. 33.

Bremi, J., Ueber seine Sammlung von Kunst-producten der Insecten; 1841, pp. 79—84. Aus der Naturgeschichte der Gallinsecten (Cecidomyia); 1844, pp. 100—104; *1848, p. 51. Ueber Anwendung des Schöpfgarnes; *1846, p. 61. Ueber Schildläuse (Coccidæ); 1847, pp. 41—44.

Chavannes, Aug., Ueber neue Seidenspinner aus Asien; 1864, p. 522.

Claparède, Ed., Ueber Entwicklung der Spinnen; 1858, p. 67.

Cornalia (de Milano), * Faits relatifs à la maladie des vers à soie; 1860, p. 20.

Coudrat, * Ueber Wanderungsverhältnisse mehrerer Schmetterlinge des Jura; 1839, p. 68.

Davall, * Tortrix pinicolana, &c.; 1858, p. 68.

* T. Siegfried, 'Geschichte der Schweizerischen Naturforschenden Gesellschaft,' &c., Zurich, 1865, pp. 98, 4to.

† Stettin. Ent. Zeitung, 1846, pp. 197—207.

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David, J. F., * Ueber Nahrung der Bienen; 1854, p. 45; 1858, pp. 69—72.

De la Harpe, J., * Einwirkung der Temperatur u. a. Einflüsse auf die Farben der Schmetterlinge; 1848, p. 56 *et seq.* * Papillon fixé sur une feuille par un champignon; 1852, p. 132.

Dietrich, C., Ueber die Käferfauna des Kts. Zürich; 1864, pp. 538—550.

Eisenring, Jos., * Ueber Schmetterlinge um Ragaz; 1826, pp. 58—61. Ueber die Schwärmer (Sphingidæ) und ihre Fahndung; 1844, pp. 157—180. * Ueber Seidenraupe und deren Zucht in Walenstad; 1857, p. 37.

Felix, Pfarrer in Nufenen, * Insecten aus Rheinwald; 1844, p. 105.

Forel, Al., Hémiptère nouveau ou peu connu en Suisse (Deltocephalus aurantiacus); 1858, pp. 196—198.

Frei-Herosé, Fr., * Ueber ein Gewebe des Papilio cratægi oder einer Tinea; 1841, p. 79.

Gengel, Cypr., Chur, Zur Naturgeschichte der Seidenraupe; 1846, pp. 201—225.

Gerber, Dr., Bern, Krätzmilben auf Katzen; 1864, p. 98.

Heer, O., Ueber geographische Verbreitung und periodisches Auftreten der Maikäfer; 1841, pp. 123—153; 1848, pp. 24—45. Zur Geschichte der Insecten; 1849, pp. 78—97. * Ueber fossile Rhynchoten; 1852, pp. 88, 89. * Communication sur les travaux de Mr. Frei sur les Microlépidoptères; 1853, p. 31.

Herpin. Genève, * Action du Kermês dans les maladies des voies respiratoires; 1845, p. 106 (medical).

Lesquereux, Léo, de Neuchâtel, * Insectes de Mammooth-Cave dans l'Amerique du Nord; 1855, p. 53.

V. Liebenau, M.D., H., Luzern, * Ueber den Bau insbesondere der Insectenflügel; 1835, p. 40.

Mellet, Pasteur, * Ueber die in der Schweiz gefundenen Käfer Odacantha melanura und Dytiscus dimidiatus; 1839, p. 68.

Meyer, Dan., * Ueber Schmetterlinge, die fixirt werden; 1851, p. 130.

Meyer-Dür, R. Burgdorf, * Cimiciden des Emmengebiets; 1843, p. 123. * Ueber massenhaftes Auftreten gewisser sonst nur sporadisch vorkommender Insecten; 1848, p. 58. Ueber klimatische und geognostiche Einflüsse auf Farben und Formen der Schmetterlinge: 1852, pp. 145—151.

Meyer, Dr. H, Zürich, * Geschlechtstheile der Lepidopteren; 1848, p. 52.

Moller, Ernst, * Vergleichende Betrachtungen über den Bau der Gliederthiere und der Wirbelthiere; 1844, pp. 181—203.

Moricand, Stef., * Fourmis du Mexique envoyées, par Berlandier; 1832, p. 38.

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Perty, M., Bern, * Ueber Häuten der Insecten; 1838, p. 152. * Distribution Géographique des Insectes; 1852, p. 134—136.

Pictet, Jules, * Ueber die Neuropteren, insbesondere die Perliden; 1840, p. 123. * Sur les Névroptères contenus dans l'ambre; 1845, p. 69.

Rion, Alph., Relation des ravages causés en Valais, par les Sauterelles en 1837, '38 et '39; 1843, pp. 118—131.

Scheuchzer, Jb., Chur, * Gordius in einer Locusta viridissima; 1844, p. 105.

Schinz, H. R., * Ueber Œnothera speciosa und die Sphinges, die in ihr sich fangen; 1835, p. 33. * Ueber eine Art Zecke (Ixodes); 1838, p. 146. Ueber Tortrix scytale, einige Plusia, &c.; 1842, p. 55.

Schnetzler, J., Vevey, * Sur la lumière dans les Vers-luisants; 1855, p. 54.

Schulze, Prof., Bonn, Structur des Leuchtorgans der Lampyris noctiluca und splendidula; 1864, p. 525.

Siebold, Prof. v., Freiburg, Ueber Zwitter unter den Bienen; 1863, p. 48 *et seq.*

Stabile, Gius.; * Enumération des Coléoptères observés dans le Tessin; 1853, p. 29. Bulletin Entomologique relatif aux Coléoptères du Mont-Rose; 1853, pp. 30, 214—222.

Yersin, Al., * Nervensystem von Gryllus campestris; 1858, pp. 65—67. * Neurophysiologie du grillon; 1861, pp. 26—28."

Mr. W. A. Lewis read a paper "On Dr. Hagen's treatment of Atropes pulsatoria and Termes fatidicum," in answer to Mr. Dunning's remarks at the previous meeting.

Mr. Lewis explained that he had made no error of the kind Mr. Dunning supposed, and that he and Mr. Dunning were at difference not upon facts, but upon the importance attached to them; Mr. Dunning had written in the language of apology only the same things which Mr. Lewis had written in the language of fault-finding.

Mr. Lewis said that the difference concerning Atropos pulsatoria was entirely one of words, and continued:—

"Mr. Dunning proves that the Linnean name pulsatoria was in 1865 transferred to an insect of the genus Clothilla, while in 1861 it had represented an insect of the genus Atropos. Granted at once; and therefore the Atropos of 1861 *is* the Clothilla of 1865, which is the proposition Mr. Dunning disputes. The very same 'pulsatoria, *Linné*,' was in 1861 described as an Atropos, and was in 1865 described as a Clothilla, and Mr. Dunning establishes to his satisfaction that the later description is correct. For the purposes of this argument, I will agree with him. What if it is? That concession leaves the facts unaltered, and only makes the indefinite definite in that it fixes the error as having been in 1861, whereas

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before it lay between that date and 1865. It is the gist of my complaint that Dr. Hagen taught me in 1861 the exact opposite of what he taught me in 1865, though all the same materials were to his hand at the one time as at the other. *I* am in my turn surprised that Mr. Dunning should think this amounts to nothing. To make a Linnean species in 1861 the type of one genus (without a note of doubt of any sort, kind, or description), and in 1865 make it the type of another genus with opposite structural characters, is a grave and not a trivial matter—more particularly when it is a part of the author's own case that if he had not written his Synopsis before he had ever studied the question, he must have found out he was wrong! Mr. Dunning would appear to have concluded that I was under some misconception, from failing to understand that I consider worthy of reprobation what he passes by as nothing."

With regard to Stett. Ent. Zeit. 1866, and Verh. zool.-bot. Gesells. in Wien, 1866, Mr. Lewis remarked that these references (with which as a fact he was before acquainted) did not affect the question of Dr. Hagen's consistency or inconsistency in 1861 and 1865; and added: "A perusal of the passages cited gives rise to one obvious reflection. The more successful the author is in showing that (when he paid attention to them) the facts were clearly in one direction, the more blameworthy he appears to be for having read them the other way before. The simple fact is that in 1861 Dr. Hagen published a Synopsis of the British Psocidæ without an investigation of the species. That is the back-bone of Mr. Dunning's remarks, and is, I presume, the thing he has come forward to justify. Chivalrous as that effort undoubtedly is, I protest Dr. Hagen will owe Mr. Dunning no thanks for it."

"In the passage quoted I draw attention to this. Termes fatidicum was an insect of which Dr. Hagen, like all other people, knew absolutely nothing at all—and Dr. Hagen, in spite of that, took upon himself to invest this impalpable idea with a number of minute and special characteristics, such as he could only have ascertained if he had had the thing under his microscope. There could hardly be a more significant example of the bad way some authors have got into in treating the old names than this case of Termes fatidicum; and if the author under discussion be a model author, then we have a model instance, and I am glad of it.

"The genus Termes of Linné is placed in his order 'Aptera,' the solitary character of which is 'Alæ nullæ in omni sexu.' The description of fatidicum is 'abdomen ovate, mouth pale, eyes fuscous;' and to this is added, 'like pulsatorium, but twice as large.' Two English authors, Westwood and Stephens, have identified 'fatidicum, *Linné*,' with an insect which came under their observation. The former speaks of 'the insufficiently characterised fatidicum,' evidently referring to the Linnean description; the latter in terms calls his insect 'fatidicum of Linné.'

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"Now take up the Entomologist's Annual for 1861, and you find in Dr. Hagen's Synopsis of the British Psocidæ (p. 22) the fatidica of Westwood and Stephens placed in a group distinguished by the presence of ocelli; and in a genus Lachesis described as having (in the male) four wings shorter than the abdomen. That is the first step. The insect which Linné gave as apterous in both sexes has four wings in the male in 1861.

"Bear in mind that Hagen's fatidica of 1861 has ocelli and short wings. Go to the 'fatidica, *Linné*,' of Hagen in 1865 (2 Ent. Mo. Mag. 121). In the first place you find it in a paper whose very title is 'Synopsis of Psocina without ocelli,' and next in a genus (Atropos) whose character is to be wingless!

"Next, Dr. Hagen, in this same 'Synopsis of Psocina without ocelli,' includes the fatidica of Westwood (as being now a different insect from the fatidica of Linné), completely ignoring the presence of ocelli which he made a leading sectional character (expressed in capital letters) four years before!

"Once more: Dr. Hagen represents Linné as giving 'Habitat Southern Europe, in dried plants received from Rolander.' The dried plants were sent by Löfling, and Rolander's name does not occur at all in connection with the insect.

"Now, the dodging about of this insect, or this supposed insect, from one section and genus to another section and opposite genus would have a justification of some kind if this treatment had been occasioned by discoveries made in the intervening periods. Well; none such were made. Says Dr. Hagen in 1861:—

"'*Obs.* I am not accurately acquainted with this genus and species; several specimens in my collection which agree with Westwood's description lead me to suppose that they are only a peculiar form of some species of Psocus in which the wings are undeveloped (!), &c.'

"Let us see then what discoveries he made before 1865. 'L. Fatidica, *Westwood.* Unknown to me'; July, 1865 (2 Ent. Mo. Mag. 124). 'Atropos Fatidica, *Linné.* I do not know this species'; July, 1865.

"Mr. Dunning says with perfect truth that what Dr. Hagen did in the case of pulsatoria was to transfer a name from one insect which he knew to another insect which he knew. But what the author has done in the case of the idea fatidicum is to invest the same thing first with one set of characters and then with another set of characters, &c., while he has never seen or identified the insect, and never met with or heard of any one who has truly done so in his belief."

Mr. Lewis remarked, in conclusion, that the more important of the two cases had not been answered by Mr. Dunning; and that the criticism impugned by him had been based on both the two instances cited, but especially

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on that of Termes fatidicum, which (at p. 55 of 'Discussion of the Law of Priority') is the climax to which the instance of Atropos pulsatoria was merely a step.

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2 December, 1872.

Prof. J. O. Westwood, M.A., F.L.S., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'The Canadian Entomologist,' vol. iv., No. 10; Presented by the Editor. 'The Zoologist' for December; by the Editor. 'The Entomologist' for December; by the Editor. 'The Entomologist's Monthly Magazine' for December; by the Editors. 'Note on a Chinese Artichoke Gall (mentioned and figured in Dr. Hance's paper 'On Silkworm-oaks') allied to the European Artichoke Gall of Aphilothrix gemmæ, *Linn.*,' by Albert Müller, F.L.S.; by the Author.

By purchase:—'Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus,' tome ix., pars 1.

Election of Members.

The following gentlemen were severally balloted for and elected:—Mons. Henri de Saussure, of Geneva, as Honorary Member, in the room of Professor Pictet, deceased; Mons. E. Pictet, of Geneva, as Foreign Member; and Messrs. A. Phipson and G. W. Bird as Ordinary Members.

Exhibitions, &c.

Prof. Westwood exhibited a drawing of a variety of Pyrameis cardui that had long been in his possession, and which was captured many years since on Margate Sands by the late Mr. Desvignes.

Mr. Bond exhibited varieties of the following British Lepidoptera:—(1) Lycæna Ægon, female, having the right-hand wings plain brown, whereas those on the left-hand were blue: he at first thought it was what is commonly called a hermaphrodite, but it really was a female combining the two varieties of that sex in one individual: this was from the New Forest. (2) A fine variety of Notodonta dodonea, captured

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at Tunbridge in 1872. (3) A *black* specimen of Acronycta megacephala, bred near London in 1872. (4) A curious variety of Miselia oxyacanthæ, taken at Portsdown in 1872.

Mr. Bond also exhibited a new British species of Ichneumonidæ (Anomalon fasciatum), bred by Mr. Mitford from the cocoons of the supposed variety of Lasiocampa trifolii obtained from larvæ found at Romney, Hants. (*Vide* Proc. Ent. Soc. 1871, p. xxxix.)

Mr. F. Smith stated that Major Munn had asked him whether queen-bees ever sting? Mr. Smith said that he had once had a queen-bee on his hand for some time without the insect making the slightest attempt to sting; and Professor Westwood said he had never been stung by one.

Mr. Champion exhibited two species of Coleoptera recently captured by him, and new to Britain, *viz.* Thyamis distinguenda, *Rye* (Ent. Monthly Magazine, ix. p. 157), from Box Hill, and Lithocaris picea, *Kraatz*, from Beauly.

Prof. Westwood exhibited drawings of Strepsiptera intended to illustrate Mr. S. S. Saunders' recently published monograph of the group.

Papers read.

The following papers were read:—

"Notes on the manner in which the ravages of a Nematus on Salix cinerea are checked by Picromerus bidens, *L.*" By Mr. Albert Müller.

"Descriptions of new genera and species of Tenebrionidæ." By Mr. F. Bates.

"On some new species of extra-tropical South-African Butterflies." By Mr. Roland Trimen.

"Catalogue of the Phytophagous Coleoptera of Japan, chiefly drawn up from materials collected by Mr. George Lewis." First portion; by Mr. J. S. Baly.

"Supplementary notes on the genus Acentropus." By Mr. J. W. Dunning.

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6 January, 1873.

Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—Stal, 'Monographie des Chrysomélides de l'Amerique,' 3 pts.; 'Homoptera nova vel minus cognita'; 'Bidrag till Reduviidernas Kännedom'; 'Bidrag till Hemipternnas Systematik'; 'Synopsis Saldarum Sueciæ'; 'Hemiptera Fabriciana,' 2 pts.; 'Bidrag till Membracidernas Kännedom'; 'Hemiptera insularum Philippinarum'; 'Bidrag till Philippinska öarnes Hemipter-fauna'; 'Enumeratio Hemipterorum,' i. & ii.; 'Orthoptera quædam africana.'—Wallengren, 'Heterocer-fjärilar, samlade i Kafferlandet af J. A. Wahlberg'; 'Nordöstra Skanes Fauna'; 'Anteckningar i Entomologi'; 'Skandinaviens Neuroptera,' i.—Fahræus, 'Coleoptera Caffrariæ, annis 1838—1845 a J. A. Wahlberg collecta, Heteromera.—Boheman, 'Spetsbergens Insekt-fauna'; 'Bidrag till Gottlands Insekt-fauna.'—Kindberg, 'Anteckningar om Östergötlands Dagfjärilar.'—Neuman, 'Vestergöthlands Hydrachnider.'—Stuxberg, 'Bidrag till Skandinaviens Myriopodologi; i. Sveriges Chilognather.'—Porath, 'Redogörelse för en un der sommaren 1868 utförd zoologisk resa till Skane och Blekinge'; 'Om nagra Myriopoder fran Azorerna.'—Thomson, 'Entomologiska anteckningar un der en resa i Skane 1866.—Thorell, 'Om Aranea lobata, *Pallas* (A. sericea, *Oliv.*);' 'Araneæ nonnullæ Novæ Hollandiæ descriptæ.'—Reuter, 'Öfversigt af Sveriges Berytidæ.'—Malm, 'Om tva för vetenskapen nya Amfipodspecies fran Bohuslän, af hvilka det ena är typ för ett nytt genus inom Pontoporeirnernas grupp.'—Holmgren, 'Bidrag till Kännedomen om Beeren Eilands och Spetsbergens Insekt-fauna.'—Presented by the Royal Swedish Academy of Sciences. 'Coleopterologische Hefte,' ix. & x.; by the Baron E. v. Harold. 'Recherches physico-chimiques sur les Articulés aquatiques,' 2e partie; by the Author, M. F. Plateau. 'Histoire Naturelle des Punaises de France,' par MM. Mulsant & Rey,—Scutellerides, Pentatomides; by Francis Walker, Esq. 'Exotic Butterflies,' part 85; by W. W. Saunders, Esq. 'Lepidoptera Exotica,' part 15; by E. W. Janson, Esq. 'Proceedings of the Royal Society,' no. 139; by the Society. 'Mélanges Orthoptérologiques,' fasc. iv. Mantides & Blattides; by the Author, M. H. de Saussure. 'The Zoologist' for January; by the Editor. 'Newman's Entomologist' for January; by the Editor. 'The Entomologist's Monthly Magazine' for January; by the Editors. 'On a new Family and Genus and two new Species of Thelyphonidea'; by the Author, the Rev. O. P. Cambridge, M.A., C.M.Z.S.

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Election of Members.

The following gentlemen were balloted for, and elected, *viz.*—G. C. Champion, Esq. (formerly a Subscriber), as Member; and B. G. Cole, Esq., as Subscriber.

Exhibitions, &c.

Mr. M'Lachlan exhibited (on behalf of Mr. George Lewis), a magnificent collection of coloured drawings of the metamorphoses of twenty-one species of Japanese Sphingidæ. These drawings had been executed, under the direction of Mr. Lewis, by a native artist, and were remarkable for the full details shown of the various states; in some cases three different varieties of the same larva were figured. Mr. Lewis requested it to be announced that he was willing to present the drawings to any Member of the Society who would undertake to publish them.

Prof. Westwood exhibited the beautiful net-work cocoon of a species of small moth from New Granada. This was attached to, or suspended from, a leaf on which was also a species of Hesperiidæ strongly affected by fungoid growths.

Mr. E. Saunders exhibited two species of Buprestidæ, from the Pelew and Caroline Islands respectively, which appeared to pertain to a new genus, notwithstanding that they bore much external resemblance to two species of Chrysodema from the East India Islands.

Mr. Champion exhibited Nanophyes gracilis and Apion sanguineum, two species of Coleoptera rare, or recently detected, in Britain.

Mr. Müller called attention to a recently-issued Government Report, intituled "Papers respecting the Phylloxera vastatrix, or new vine-scourge," detailing an account of the ravages of this insect in various continental districts, and the means that had, with more or less success, been adopted for preventing its spread. Prof. Westwood stated that the occurrence of the insect in England had been noticed by him in 1862, in a paper read before the Ashmolean Society.

Papers read, &c.

Dr. Sharp communicated a list of the water-beetles of Japan, chiefly drawn up from materials collected by Mr. George Lewis, with remarks on the distribution of the said insects.

Mr. Wollaston communicated two papers. First, on a new genus (Pseudotarphius) of Colydiidæ from Japan; and secondly, on the Cossonidæ of the same islands. In the latter paper the author commented upon the apparent absence of European types in the districts of Japan visited by Mr. Lewis, and stated that their place seemed to be taken by representative forms. Mr. Pascoe thought the fauna of Japan might be indicated as

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"satellite" (like that of Madagascar, &c.), having a quantity of peculiar species mixed with others; and a great deal in common with the coasts of China and Siberia. Mr. H. W. Bates asked that judgment upon the affinities of the Japanese fauna be suspended pending further information. He said that although there were many Western European species found also in Japan, the collective faunas of the two regions were totally distinct.

New Part of 'Transactions.'

Part iv. of the 'Transactions' for 1872 (published in December, 1872) was on the table.

ANNUAL MEETING,

27 January, 1873.

Prof. Westwood, M.A., F.L.S., President, in the chair.

The Treasurer's accounts for 1872 were read in abstract by Mr. Stainton, one of the Auditors, and showed a balance of £160 12*s*. 1*d*. in favour of the Society.

The Secretary read the following:—

Report of the Council for 1872.

The Council presents the following Report, in accordance with the Bye-Laws.

During the past year there have been two deaths among our Members, *viz.*, Professor Pictet, one of the Honorary Members, and Mr. Charles Horne, an Ordinary Member. But the number of Members and Subscribers elected is in excess of the losses caused by death and resignation.

The vacancy in the list of Honorary Members occasioned by the death of Prof. Pictet has been filled up by the election of his distinguished relative Dr. Henri de Saussure.

The Meetings of the Society have been exceedingly well attended. According to the Librarian's report, it appears that the Library has been extensively made use of by the Members and Subscribers, thirty of whom, during the year, borrowed books amounting in the aggregate to 195 volumes.

One Composition in lieu of Annual Subscriptions has been received and invested.

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The income and expenditure for the year may be roughly estimated as follows:—

Receipts.	£	Payments.	£
Contributions of Members	199	Investment	15
Sale of Publications	58	'Transactions' & 'Proceedings'	148
Interest on Consols	5	One Part of Catalogue	60
Donations	55	Library	12
		Rent and Office Expenses	55
		Tea at Meetings	13
	£317		£303

The volume of 'Transactions' published in 1872 is thinner than usual, owing to several suitable papers not having been read in time; but this is counterbalanced by the number of expensive coloured plates.

The receipts from the sale of publications again show a considerable diminution, especially as regards the sale of back stock, which appears to be liable to much fluctuation.

A further and very bulky part of the proposed general Catalogue of the Insects of the British Isles (enumerating the Ichneumonidæ, Braconidæ, &c., compiled by the Rev. T. A. Marshall) has recently appeared. The Council regret that their endeavours to procure aid from the Government Grant Committee of the Royal Society, towards the publication of this Catalogue, have not been successful.

The sum of £55 appearing under the item of "donations" is made up of £50 received from Mr. J. W. Dunning, and £5 from Mr. W. Wilson Saunders, to both of whom the Society was already so much indebted for former liberal gifts. And the Council further desire to express their thanks to Major Parry for a plate illustrating his paper.

Owing to these extraordinary items of income, the cash balance in hand, small though it may appear, is considerably in excess of the usual sum; but from the number of valuable papers already accepted for publication in 1873, it is evident to the Council that every endeavour must be used to increase our ordinary income by inducing entomologists, not yet of our body, to join us.

27th January, 1873

The following gentlemen were elected Members of Council for 1873:—Messrs. H. W. Bates, Butler, Grut, M'Lachlan, Müller, S. S. Saunders, F. Smith, Stainton, Stevens, Verrall, C. O. Waterhouse, Weir and Westwood.

The following officers for 1873 were subsequently elected:—President, Prof. Westwood; Treasurer, Mr. R. M'Lachlan; Secretaries, Messrs. F. Grut and G. H. Verrall. Librarian, Mr. E. W. Janson.

The President read the following Address:—

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THE PRESIDENT'S ADDRESS.

GENTLEMEN,

Time, in its inexorable flight, has again brought round to me the duty as well as the privilege of delivering to you, as President of the Entomological Society, one of those annual addresses which are expected to afford a concise view of the progress of Entomological Science during the past year. Looking still further back, during the long vista of half a century, what abundant sources of congratulation do I not observe in the now wide-spread cultivation of our favourite science—mixed, like everything of this earth, with deep regrets at the heavy losses which we have sustained by the deaths of so many of our scientific friends.

You have been made acquainted, in the very satisfactory Report from the Council which has just been read, with the material condition of our Society, and have testified, by the full attendance at our meetings, to the scientific advantages resulting from such gatherings, and which, in our case, have originated in a desire to extend the subjects of our meetings beyond the mere technical details and descriptions of new species. I may in a more especial manner allude to the great additions which have been made to our Library, which ought to be highly appreciated by our members, owing to the liberal use which is allowed to be made of the books; still more especially do I feel bound to allude to the very valuable series of memoirs (being the whole of the entomological papers published by the Royal Society of Sweden during the last ten years) which we owe to the liberality of that Society, as well as to the very numerous and valuable donations made to the Library by Mr. Dunning.

OBITUARY.

I regret to announce the loss of several of our oldest entomologists during the past year.

George Robert Gray, F.R.S., was one of the founders of this Society, and, although more especially attached to Ornithology,

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was best known as an entomologist by his share in the insect portion of Griffiths' translation of Cuvier's 'Règne Animal,' by his Monograph of the Phasmidæ, and his quarto work on the insects of that family inhabiting Australia, and by a beautifully illustrated Catalogue of the Genus Papilio, published by the Trustees of the British Museum. He was essentially skilful in Catalogue-making, and thoroughly understood the mode of treating synonyms. He was a man of genial manners; and I recall to mind an interesting visit which we made to Paris in 1832, when we had the pleasure of becoming personally acquainted with Cuvier, Latreille and Audouin. He was born on the 8th of July, 1808, and died on the 6th of May, 1872.

James Charles Dale, M.A., F.L.S., who died on the 6th of February last, at the age of eighty years, was one of the most indefatigable collectors of English insects, upon which his published notes are very numerous, although short, and confined to dates of captures, localities, &c. His collections were used to a very great extent by Mr. Curtis.

Charles Horne, Esq., died on the 21st of March last, in his forty-eighth year, having passed many years of his life in India, where he carefully observed the habits of many species of insects, especially Hymenoptera, upon which he published a beautifully illustrated memoir in the 'Transactions of the Zoological Society of London.'

Robert Smith Edleston died on the 31st of October last, aged fifty-three years. He had devoted the leisure of many years to his collection of British Lepidoptera, and had latterly paid some attention to British Coleoptera.

Of our Foreign Honorary Members we have lost François Jules Pictet (de la Rive), who died on the 15th of March, 1872, in his sixty-third year, having been born on the 27th of September, 1809. His entomological productions are almost entirely confined to the Neuroptera, his Monographs on the Phryganeidæ, Perlidæ and Ephemeridæ being of the highest importance. For many years past his attention had been devoted to Palæontology. The list of his memoirs occupies ten octavo pages in the excellent memoir of him published by M. Soret, illustrated by an admirable photograph recalling his genial features, with which we were made acquainted during his several visits to this country.

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Professor Constantin Wesmael, the distinguished author of many memoirs, especially upon the Ichneumonidæ of Belgium, died on the 25th of October last, having been born at Brussels in 1798. One of my pleasant entomological recollections is that of meeting him one day in Brussels starting off on one of his collecting excursions, attended by a brace of gigantic St. Bernard dogs as a defence against the wolves in the Belgian forest, to which he was bound.

Dr. Franz Xaver Fieber died on the 23rd of February last, at the age of sixty-five. His attention was especially devoted to the European Hemiptera, upon which order his elaborate work, 'Die europäischen Hemiptera (Rhynchota Heteroptera),' 8vo, Wien, 1861, is one of the best treatises in existence.

Coleman T. Robinson, late President of the American Entomological Society, who died at the age of thirty-four, was the joint author, with Mr. Grote, of a series of excellent memoirs on the Lepidoptera of the United States published in the 'Transactions' of the Society, of which he was an exceedingly liberal supporter. A list of his writings from the pen of Mr. Grote, appears in the 'Canadian Entomologist,' vol. iv., No. 7.

General Progress.

The vast progress made in the Physical Sciences during the last quarter of a century has had, as a necessary result, a great effect in breaking down the old exclusive system of education in the Universities, and more especially in the one to which I have the honour to belong, in which Classics, Divinity and Mathematics have until lately been almost the only subjects to which the more serious attention of the students was directed, and to which honours were attached. In the course of the year 1872 a Natural Science School having, for the first time, been established in the University, the Board of Studies of that school, after great deliberation, issued a notice as to the range of subjects included in the "Preliminary"* and "Final" Honour Examinations, in the latter of which Zoology was introduced as a branch of Biology, the general principles of which (including Comparative as well as

* The Preliminary Honour Examination is compulsory upon all the candidates in the Natural Science School, and is restricted to the more elementary parts of Mechanics, Physics and Chemistry.

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General Anatomy and Physiology) were insisted upon from every anatomical, geological, mineralogical, palæontological, zoological and botanical student. The following are the subjects laid down for the students in Zoology:—

1. The general principles of Classification, applied to the animal kingdom, together with a comparison of the more important systems hitherto proposed for that purpose.
2. The structures and habits of animals, with especial reference to their external organs.
3. The types of extinct animals, in order to show their position and relationship with existing groups.

And for more especial subjects:—

a. The classification, geographical distribution, affinities, economy, transformations and development of the animals comprised in some one or more of the families, genera or individual species of animals; with practical illustrations, by dissection and delineation, of their structure.

b. The minute details of structure of special individual organs may also be practically shown and illustrated by dissection; *e.g.*—

The organs of flight throughout the Insecta.

The mouth organs in the Crustacea.

The embryonic and metamorphotic changes occurring in one or more of the species of any family, especially among the Invertebrata.

c. The student may offer himself for examination upon the Fauna of any district in the British islands; *e.g.*—

The animals of the Isis and Cherwell.

The indigenous invertebrated Fauna of the neighbourhood of Oxford.

It may possibly be found that the amount of matter thus required from the zoological student (in addition to the thorough grounding in the general principles of Physical and Natural Science also required) may deter many young men from taking up Zoology as a subject for their final honour examination, but it has been the object of the Board rather to produce a few thoroughly well-grounded naturalists than a number of dabblers in science.

In immediate connexion with, and in respect to, the effects which will ultimately result from the more systematic teaching of

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the Natural and Physical Sciences in our great schools, it may be further mentioned that the Board of Schoolmasters, with Dr. Ridding, the principal of Winchester School, at their head, have requested the opinion of the Board of the Natural Science School at Oxford, as to the subjects most essential to be made elements in general education, and that, amongst other suggestions made by the latter body, is the formation of local Museums to be attached to each of the great seminaries.*

The progress of Zoological Science in North America is singularly proved by the Annual Report made to the Trustees of the Museum of Comparative Anatomy at Harvard College, Cambridge, by Louis Agassiz, the Director, published at Boston, 1872. The collection of all classes of animals which (by the liberality of the Government in establishing a great National Museum) are being accumulated at Harvard College, are especially extensive in the Articulated Series, under the enlightened superintendence of Dr. Hagen, whose comprehensive plan of arrangement, as set forth in the preceding year's Report, is alluded to by M. Agassiz in a very satisfactory manner, one portion of which, namely, the formation, from the duplicates, of entomological collections for the Normal Schools (which has been long adopted in France, and which I have inaugurated at Oxford by sending a collection of British Coleoptera to the College at Clifton) is deserving of imitation at our National Museum.

I may be allowed to direct your attention to another subject which proves in a very satisfactory manner the extensive progress making in the investigation of natural objects, owing in a great degree to the employment of the microscope in a scientific manner. I recollect the time when the objects selected for use in this instrument were few in number, and of every character from a flea to a grain of mustard-seed. Now we have microscopes made for and used by the million, and not only have we several Microscopical Societies—(a new one devoted to Human Histology has just been formed)—but also Microscopical Journals and Transactions, and even cheap weekly publications in which many excellent microscopical objects have been for the first time illustrated.

* I may perhaps here be allowed to mention that during the very time that this Address was being delivered, a public meeting was being held in Lambeth, with the view of establishing another branch of our great National Museum in the South of London.

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I cannot too strongly press upon microscopical observers the advantages which will accrue to Science by their restricting their researches in some special direction, instead of frittering it away upon an endless variety of objects.

A matter worthy of much congratulation has been brought to a successful termination during the past year. I allude to the completion of the great Catalogue of detached Memoirs published in the various scientific Transactions and Periodicals up to the year 1863, taken in hand by the Royal Society. It occupied me a large portion of ten years of the best period of my life to wade through these various works in collecting the materials for my 'Introduction.' Had the Catalogue been then in existence a large amount of this time would have been saved.

Fossil Entomology.

The study of fossil articulated animals has not hitherto been sufficiently attended to by our systematic entomologists, although it cannot be denied that they are entitled to great weight in a classificational point of view, whether regarded by one class of students (the evolutionists) as the progenitors of the now-existing races, or by another class as the exponents of so many lost links in a great and entire scheme of Creation, where every animal had its real place assigned to it; in fact, as osculant groups bridging over great gaps in the existing state of the Animal Kingdom. Thus, with reference to the singular fossil bird, Archæopteryx, lately discovered, possessing a long jointed and feathered tail, the latter class of naturalists might, in one point of view, regard it as a link between birds and quadrupeds, whilst the former would simply consider it as one of the progenitors of some race of quadrupeds which had changed its feathers for hairs.* In like manner also the singular fossil aquatic bird from the cretaceous shales of Kansas, of which a preliminary notice has

* I am aware of the relationship claimed for the Archæopteryx with the Reptiles, but have here treated it as a link between birds and mammals, on the authority of Professor Owen's statements that "in general shape and proportions the tail resembles rather that of a Petaurus or squirrel than that of a modern bird" (Phil. Trans. 1863, p. 36); and that "when we recall the single unguiculate digit in the wing of Pteropus and the number of such digits, equalling that in Pterodactylus, in the fore foot of the flying lemur (Galeopithecus), the tendency to see only a reptilian character in what may have been the structure of the manus in Archæopteryx receives a due check" (Ibid. p. 46).

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only just been published by Prof. Marsh, of Yale College, and which differs from all known birds in having the centre of its vertebræ doubly concave (a character hitherto found only in some of the groups of reptiles), might be considered by one class of students as a link between birds and reptiles, and by the other as a reptile, such as Platydactylus homalocephalus, with its many-lobed tail, which had changed its scales to feathers. This bird is about the size of a pigeon, and is to be named Ichthyornis dispar.

It is true indeed that the very indistinct and fragmentary condition of many fossil insects prevents our studying them with sufficient precision, but the student need only to cast his eyes over the pages of Mr. Packard's most excellent 'Guide to the Study of Insects' to see how greatly the fossil forms assist in the general classification of those Articulata which form the subject of his book. It is, however, amongst the Crustacea that we naturally find far more numerous and more important materials for this purpose, and we can well refer with national pride to the noble memoirs on the fossil Decapoda Brachyura by Professor Bell, on the Trilobites by J. W. Salter, on the Fossil Entomostraca and Estherea by T. Rupert Jones, and on the Fossil Cirripedes by C. Darwin, all published in the volumes of the Palæontographical Society's 'Transactions.' A still more remarkable series of papers is now, however, in course of publication by the same Society, by H. Woodward, on the Fossil Merostomata, animals the great majority of which have only recently been discovered, and which surprise us, not only from their strange forms and interesting relations, but also from their including the most gigantic of known articulated animals, some of them acquiring a length of four feet, with a breadth of fifteen inches (Pterygotus anglicus), whence they have been formed by Prof. Häckel into a sub-order of Pœcilopoda named Gigantostraca in his 'Generelle Morphologie.' These creatures appear to be most nearly allied to the order Xiphosura, or King Crabs (Limulidæ), on the one hand, and to the Trilobites on the other. I regret that space will not permit me to bring before you an analysis of the four parts of Mr. Woodward's admirable 'Monograph of the British Fossil Crustacea of the order Merostomata,' and that I must be content to refer you to his other papers in the 'Geological Magazine' (vols. viii. and ix.), and the 'Quarterly Journal of the Geological

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Society' for August, 1871, and February, 1872, and especially to his two Reports made to the British Association in 1871 and 1872, on the Structure and Classification of Fossil Crustacea.'*

A memoir 'Sur les Insectes fossiles du Calcaire lithographique de la Bavière,' by H. Weyenbergh, appears to have escaped the notice of English geologists (published at Harlem, 1869, imp. 8vo, pp. 48, with four plates). The species belong to the orders Diptera, Neuroptera, Orthoptera, Coleoptera, Hymenoptera, Hemiptera, Homoptera and Lepidoptera (of which last order there is a large Sphinx described under the name of S. Snellii).

It is an interesting fact that the only species of fossil insect which has been found identical in the "calcaire jurassique" of Bavaria and in the wealden and lias of Great Britain is the Heterophlebia dislocata, *Westw.*, although there are many Coleopterous, Dipterous, and especially Orthopterous and Neuropterous genera, which are found in both formations.

The 'Geological Magazine' has contained a valuable series of papers from time to time on the "Fossil Insect Remains of England," the first of which appeared in vol. iii., in 1866, containing the wing of a new species of dragonfly (Libellula Westwoodii) from the Stonesfield slate near Oxford, contributed by Prof. J. Phillips, the veteran geologist. Vol. iv. (1867) contains a paper by Mr. J. W. Kirkby, on the remains of two Orthopterous insects from the coal-measures near Sunderland; and Prof. Dawson, of Montreal, records the remains of five new insects from the Devonian shales, St. John's, New Brunswick (pl. xvii,

* In his fourth memoir Mr. Woodward has refigured from my drawing the curious unique fossil specimen in the Hopeian Collection, from Coalbrook Dale, which I had likened to the larva of a Saturnia, but which Mr. Salter has redescribed under the name of "Eurypterus? (Euphoberia) ferox," and as allied to the preceding fossil Crustacea. Another specimen, closely allied to, if not identical with, the same animal has been found in America, and described by Messrs. Meek and Worthen, by whom it is provisionally referred to the Myriapoda. Supposing it not to have possessed articulated ventral legs, I am not disposed to give up the idea that the animal in question is the larva of some unknown insect, and I am the more confirmed in this opinion by the very interesting discovery of the larva of the Neuropterous genus Bittacus by Dr. Brauer, elsewhere alluded to, which possesses several rows of branching spines on each segment; now the Oxford specimen is just what a gigantic Bittacus larva would be, and Bittacus itself is one of those strange forms which seems quite out of place amongst the existing Neuropterous insects. Mr. M'Lachlan, moreover, suggests to me that one of the fossil wings represented from my drawings in Mr. P. Brodie's work is apparently that of a species of Bittacus.

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figs. 1—5). In vol. v. (1868) Mr. Samuel H. Scudder, of Boston, U. S., gave a full account of eighty-seven species of insects, six of which are from the Devonian, fifteen from the carboniferous, one from the Trias, and sixty-five from the tertiaries. Ten of these are Coleoptera, four Orthoptera, nine Neuroptera, five either Orthoptera or Neuroptera, three Hymenoptera, forty-five are Diptera, six Hemiptera, whilst three are Lepidoptera, one doubtful carboniferous form and two from the tertiaries, and two are Myriapoda from the carboniferous.

In 1871 an Arachnide, under the generic name of Eophrynus, was redescribed by H. Woodward, Esq., from a new and very perfect specimen, it having been originally described and figured by Dr. Buckland, on the authority of the late G. Samouelle, as a weevil, with the name Curculioides Prestvicii. This paper is accompanied by a list of forty-four insects from the coal-measures, seven from the Devonian and one Permian example.

The group of Adelarthrosomata is one of the greatest interest amongst the Arachnida, not only from the great diversity of structure and general disagreement in form from the ordinary types of the class, but also from the great gaps occurring between the different component groups. It is therefore worthy of notice that Mr. Woodward has described a new form in the group in the 'Geological Magazine' for September, 1872, under the name of Architarbus, founded upon a specimen found in the iron-stone measures of Lancashire, with which also a North American species, figured by Mr. Scudder, appears to be congeneric. Mr. Woodward contrasts the genus with Phrynus and Phalangium. It, however, in my opinion, is much more closely allied to Trogulus.

A new fossil butterfly has been described by Mr. Scudder, from Aix, in Provence, under the name of Satyrites Reynesii, in the 'Revue et Mag. de Zool.,' 1872, pl. 7, republished in the 'Geological Magazine'; and lastly, in the present month's (January) number of the latter work, is a short paper by Mr. Butler, containing figures and descriptions of Mr. Charlesworth's fine wing of a butterfly from Stonesfield, under the name of Palæontina oolitica, allied to the tropical American genera Caligo, Dasyophthalma and Brassolis, together with copies of the Cyllo sepulta, *Boisduval*, Ann. Ent. Soc. France, 1840 (Vanessa sepulta, *Lefebvre*, Annales, 1851), from the cretaceous white-sandstone of Aix-la-

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Chapelle, and the Junonia? Pluto (Vanessa Pluto, *Heer*, Nouv. Mem. Soc. Helv. 1850, pl. 14), from the Lower Miocene marlstone of Radaboj, in Croatia, which had been regarded by the American Lepidopterist, Mr. W. H. Edwards, as an Argynnis.

In his new work, on the 'Geology of Oxford and the Valley of the Thames,' Professor Phillips has also figured fossil insects belonging to the genera Buprestidium, Curculionidium, Hemerobioides, Blapsidium, Melolonthideum and Prionideum from Eyeford and Stonesfield.

Embryological Development and Metamorphoses.

The development of the ovum is a subject to which great attention has lately been attached, especially with reference to its connexion with the so-called primitive forms of life in the Animal Kingdom, and I need scarcely remind you that this was the subject upon which Sir John Lubbock especially dwelt in his Presidential Address in 1867. Several highly important memoirs have subsequently been published, to the most recent of which I must direct your attention.

The Embryology and earliest stages of development of two species of Dragonflies and of a species of Thysanura belonging to the Genus Isotoma, have formed the subject of an elaborate treatise by A. S. Packard, jun., being the second memoir of the Peabody Academy of Sciences (Salem, Mass., 1871), in which the author shows that in their earliest stage these animals belong to two distinct sections, namely, those in which the germ is either an endoblast or an ectoblast (that is, the primitive band is developed on the outside or on the inside of the yolk); another result appears to be that the supposition entertained by some writers that the eyes of Crustacea and insects represent limbs, and require a distinct segment of the head for their primal development and support cannot be maintained, and that the head-joints are only represented by the antennæ, mandibles, maxillæ and second maxillæ or labium.

Mr. Packard has followed up the same subject in his "Memoir on the Embryology of Chrysopa, and its Bearings on the Classification of the Neuroptera" (published in the 'American Naturalist,' vol. v., and reprinted, with additional notes by the author, in the 'Quarterly Journal of Microscopical Science,' April, 1872). Here the author states that, with reference to the position of the

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primitive band in relation to the yolk, the Hexapodous orders Hymenoptera, Diptera, and certain Coleoptera (Curculionidæ and Donacia), and the Phryganeidæ and Poduridæ (genus Isotoma) are ectoblasts, whilst Telephorus and the Hemiptera, with certain Neuroptera (Libellulidæ and Hemerobiidæ) are endoblasts, to use Dr. Dohrn's terms. The embryology of the Hemerobiidæ is identical with that of the Libellulidæ. "What therefore," asks Mr. Packard, "of the distinction between the Pseudo-Neuroptera and the true Neuroptera insisted on by some of the leading entomologists since Erichson's day? Never believing that the differences were great enough to separate the Linnean Neuroptera into two independent orders or sub-orders (whichever we may choose to call them), I now ask if Embryology does not give independent testimony to the close alliance at least of the Libellulidæ and Hemerobiidæ, even if we go no further?" And thus the position of the animal in the ovum is allowed to unite into one group Libellula with its active, and Hemerobius with its necromorphous pupa; and to separate widely Hemerobius and Phryganea, both with inactive pupæ, which are, however, furnished with jaws of a structure, *per se*, for biting a hole in the cocoon before arriving at the fully-developed imago state. I confess that this specimen of classification founded upon embryological data does not carry to my mind conviction of its superior worth.

The singular form of the king crab, and its relationship, on the one hand, to the Trilobites, and, on the other, to the gigantic fossil Merostomata, above noticed, have given to the observations which have recently been published on its development and embryology a very high value. We are indebted to three independent observers for a series of articles on this subject, namely, —1. "The Horse Crab," by Dr. Lockwood ('American Naturalist,' July, 1870); 2. "Zur Embryologie und Morphologie des Limulus polyphemus," by Dr. Anton Dohrn (Jenaische Zeitschr. B. vi., tab. xiv. and xv.); and 3, "On the Embryology of Limulus polyphemus," by Dr. A. S. Packard ('American Naturalist,' vol. iv. Oct. 1870). It is to the last-named gentleman that I am indebted for a series of the eggs and young animals of this species, which he was so good as to give me during his late visit to Oxford. A succinct account of the observations contained in these three memoirs is given by Mr. Woodward in the 'Quarterly Journal of the Geological Society' for February, 1872. The subject of the

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relationships of these groups has been discussed at considerable length in 'Nature.'

Professor Van Beneden has also read a memoir on the systematic position of the Limuli and Trilobites, which last group he considers must now be separated from the Crustacea, forming with the scorpions, &c., a distinct branch of the Arachnida.

Prof. Claus has published, in the sixteenth volume of the 'Abhandlungen' of the Royal Society of Göttingen, a highly important memoir on the Metamorphoses of the Squillidæ, one of the most aberrant groups of the higher Crustacea, in which he has apparently proved satisfactorily that the remarkable forms called glass-crabs, described by Crustaceologists under the generic names of Alima, Erichthus and Squillerichthus are only the early states of species of Squillæ. The memoir is accompanied by eight elaborate plates crowded with figures, in which the development of the Squillæ through their different forms is carefully traced and delineated.

An elaborate memoir, by M. Balbiani, on the development of the ovum of the species of the genus Phalangium, is published in the 'Annales des Sciences Naturelles,' Série V., vol. xvi. (pl. 1), which presents two observations of much interest: 1st, the young animal is in this state furnished with the full complement of four pairs of legs; and 2nd, these limbs, owing to their great length, are in the egg-state folded back upon each other. Two plates illustrate this memoir.

A very excellent summary of Siebold's "New Researches in Parthenogenesis" ('Beiträge zur Parthenogenesis der Arthropoden'), and indeed of the nature of that peculiar condition of development, has been given by Mr. Ray Lankester in 'Nature,' vol. vi. pp. 483 and 523.

A memoir by Prof. Duncan, F.R.S., was read at the meeting of the British Association, 1872, on Insect Metamorphosis regarded as an acquired peculiarity by evolution. The minute anatomical structure of the œsophagus, pylorus and stomach at different stages of growth, and the gradual formation of the wings beneath the skin of the larva upon the air-tubes and blind stigmata of the second and third segments of the body, were carefully illustrated, the author contending that "the wings are progressively developed, and that they grow from simple protoplasms into all their beauty and complexity of form during the stages after the escape

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from the egg. They are acquired organs, and are given to the insect during its progress of change. Like the metamorphoses, they are superadded to the original condition of the embryo or the young within the egg." After some remarks upon classification founded on metamorphoses, the value of which the author denies (which remarks, however, appear to me to be ill-founded), the author gives the following summary of his views:—

"1. The Insecta have a great geological age. 2. The earliest did not undergo metamorphoses, but simply shed their skins. 3. The first forms were wingless Neuroptera or Orthoptera. 4. That in order to meet the influence of changes in external physical conditions during the evolution of varieties of the original forms; the metamorphoses were acquired. 5. Incomplete metamorphoses preceded the complete. 6. Organs of flight were acquired independently of metamorphosis. 7. The kind of metamorphosis depended upon peculiarities in the external conditions, and its determination was defined by law."—'*Nature*,' *Nov.* 14 and 21, 1872.

The remarkable memoir by M. Balbiani on the generation and embryology of the Aphides has been brought to a close in the 'Annales des Sciences Naturelles' during the past year.

Metamorphoses.

The rapid progress in Physical Science making in North America is well illustrated by the publication of a series of publications entitled an 'Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College.' The fifth number of this work, by Louis Cabot, is devoted to the immature states of the Gomphina, a subdivision of the Libellulidæ, of which seventeen species are illustrated, belonging to the genera Heterogomphus, Gomphus, Macrogomphus, Progomphus, Gomphoides, Hagenius, Ictinus and Cordulegaster. All the figures represent the insects with well-developed wing-cases, and in the description the immature condition of the insect is described under the name of "Nympha," but the author states that he had seen "8 nymphæ, *very young* and full grown," of Hagenius brevistylus, and after describing the "Nympha, male," of a species of Ictinus, he adds, "This *larva* is extremely interesting." The three plates illustrating this memoir are admirably executed, the whole forming a real contribution to the Science.

The transformations of several Neuropterous insects have been carefully investigated by Herr Brauer, *viz.*, Micromus, belonging

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to the Hemerobiidæ, Panorpa communis and Bittacus Italicus, and Hagenii, *Brauer*. The larvæ of the latter are extremely interesting animals, being covered with large branching spines like the caterpillars of some species of Vanessa (Vienna Zool. Botan. Verein, 1871).

The admirable series of illustrations of the larvæ of Coleoptera by Dr. Schiödte has been continued in the 'Tijdskrift,' of Copenhagen.

We are indebted to Dr. Emile Joly, of Toulouse, for several "memoires" on the transformations of different species of Ephemeridæ, published in the Bulletin of the Society of Natural History of that city, vol. iv.

The same gentleman has also published a curious memoir, "Sur un nouveau cas d'hyper-metamorphose constaté chez la Palingenia Virgo a l'état de Larve," in the 'Annales des Sciences Naturelles.'

Naturalists have been long interested as to the real character and relations of a small aquatic animal, figured by Geoffroy under the name of the "Binocle à queue en plumet," found near Paris, which had eluded all subsequent research. Latreille, however, obtained specimens of an analogous animal from Madagascar (which I fortunately secured in one of my visits to Paris, and which are now in the Oxford Museum), and on which he founded the genus Prosopistoma, in the 'Nouv. Annales du Museum,' t. 11, p. 23, ranging it amongst the Branchiopodous Crustacea. An elaborate memoir on the French species of this genus by Messrs. N. and E. Joly have led them to the conclusion (upon grounds which I have not space to detail) that the animal is an insect, and that it is most nearly allied to the larvæ of certain Ephemeridæ ('Annales des Scienc. Natur., tom. xvi.)

A summary of the memoir by Dr. Joly on the genus Prosopistoma, regarded by him as the immature state of a species of Ephemeridæ, has also been published in the 'Mémoires de la Société Nationale des Sciences Naturelles de Cherbourg,' tome xvi.)

We are indebted to M. C. Ritsema, of Leyden, for an interesting memoir on the transformations of the common flea, treated in a popular manner, and published with illustrations in the 'Album der Natuur' for 1872.

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Economic Entomology.

The necessity for the thoughtful and thorough investigation of the economy of the various species of noxious and beneficial insects has been fully recognized in North America, as shown by the judicious appointment of "State Entomologists" in some of the States. These gentlemen are required to furnish annual reports to their respective Governments, and the "Fourth Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri, made to the State Board of Agriculture, pursuant to an appropriation for that purpose from the Legislature of the State, by Charles V. Riley, State Entomologist (8vo. 1872), Jefferson City, Mo." is now before me, and comprises 150 closely-printed pages, illustrated with a considerable number of very excellent woodcuts. We here see the good results of Mr. Riley's visit to Europe during 1871, especially in that part of his Report in which he treats, at great length, on the economy and history of the Phylloxera of the vine, with an excellent practical account of the susceptibility of the various varieties of the vine grown in America to the attacks of the Phylloxera, either on the roots or leaves of the plant.

The importance of the silkworm culture in North America is also shown by Mr. Riley, in his fourth Report above noticed, by the large space devoted to the history of the different large species of Bombycidæ which are used for the purpose of obtaining silk in the States. These are B. Mori, Cecropia, Cynthia, Promethea, Luna, Polyphemus, Yama-Mai and Pernyi.

Other injurious insects are described, including the Doryphora of the potato, the codling moth, the Colaspis of the grape vine, the Pentatoma of the cabbage, Passalus cornutus, Bostrichus bicaudatus, together with a number of Tortricidæ and Tineidæ.

In our own country the Horticultural Society of London has again evinced a desire to further the investigation of the habits of obnoxious insects, by instituting "Prizes for Collections of Economic Entomology, in 1873," of which the following is a programme:—

"The Royal Horticultural Society offers the following prizes:—£10 for a collection of British insects injurious to some one order of plants used for food—as Cruciferæ, Leguminosæ, or Corn; the Order may be selected by the competitor. £3 for a miscellaneous collection of British insects injurious

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to plants used as food. £5 for a collection of British beetles injurious to timber and fruit trees, either growing or felled. £2 for a collection of British insects injurious to some one timber or fruit tree. The insects to be exhibited in their various stages of development, accompanied by specimens, models, or drawings of the injuries caused by them. The collections to be sent in to Mr. Richards, Assistant Secretary, Royal Horticultural Society, South Kensington, S.W., on or before 1st November, 1873."

It is especially worthy of record that the large collections of Economic Entomology formed in France by M. Guérin-Meneville, have during the past year been presented by him to the great Natural History Museum of Paris.

The ravages of Phylloxera vastatrix are unfortunately widely extending in Europe, and have reached Portugal, where they threaten seriously to affect our wine supply. The attention of the Government has been called to the question, and an official document has been published on the subject, which well illustrates the ordinary *modus operandi* of our authorities in such matters, contrasting most unfavourably with the proceedings of the French and American Governments. Instead of calling to their aid the services of a committee of skilled naturalists, or even those of a single entomologist, as is now done by several of the American States, we have here no less than seventeen documents from Consuls, &c., which tell us nothing new on the subject, with the exception of the Report addressed to the French Minister of Agriculture and Commerce by a Scientific Commission appointed by the Government of France to study this new disease, and which bears the signatures of Messrs. Dumas, Duchartre, Milne-Edwards, Paul Gervais and four others. Here the whole question of the economy of the insect has been investigated, and illustrated by a series of highly magnified figures.*

The great interest which has been raised by the ravages of this small but terrible insect upon the vines, both in America and Europe, may be conceived when it is stated that in an extended bibliographical memoir for which we are indebted to Messrs. Planchon and Lichtenstein (Montpellier, 1872), notices are given

* A translation of this Report, with copies of the figures, has appeared in the 'Journal of Horticulture,' in which work is a series of well-written articles on Garden Insects, by an anonymous writer, the last of which, No. 36, appeared in the last part.

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of not fewer than 484 treatises or articles which have been published on the insect, and which are here analysed.*

The cotton culture of Brazil is one of the most important occupations of the South American planters. The plants are, however, attacked to a great extent by the mining larvæ of a small moth (Cemiostoma Coffeellum, *Stainton*), whose ravages and economy have been investigated by Mr. B. Pickman Mann, "as Entomologist to the Government of Brazil," by whom an interesting memoir has been published in the 'American Naturalist' for June and October, 1872.

The subject had been previously investigated by Messrs. Guérin-Meneville and Perrottet, in a 'Mémoire sur un Insecte et un Champignon qui ravagent les Caféiers aux Antilles" ('Revue Entomologique,' 1842); by Herr Nietner, "Observations on the Cotton Tree in Ceylon" (published at the 'Ceylon Times' Office, 1861); and by Mr. Stainton, "A few Words respecting Cemiostoma Coffeella, an Insect injurious to the Coffee Plantations of the West Indies" ('Entom. Weekly Intell.' 1861, vol. x.)

The Report of the Entomological Society of Ontario for 1871 has recently been published, including reports on some of the noxious and beneficial insects of the province, illustrated by upwards of a hundred woodcuts. The insects affecting the apple, the wheat crops and the cabbage, are described by the Rev. C. J. S. Bethune, President of the Society; those affecting the grape, the currant and the gooseberry, have been undertaken by Mr. W. Saunders, the Vice-President; whilst Mr. E. B. Reed has given an account of the insects in connexion with the plum, potatoes, cucumber, melon, &c.

A 'Second Annual Report on the Injurious and Beneficial Insects of Massachusetts' has also been published by A. S. Packard, jun., M.D., which I have not yet seen.

Physiology.

A very curious physiological memoir on the position of the centre of gravity in insects, has been published by M. Plateau, in the 'Archives des Sciences Physiques et Naturelles,' tom. xliii.

* It was on the 25th November, 1867, that my notice of this insect, described by me under the name of Peritymbia vitisana, was communicated to the Ashmolean Society of Oxford. This is here mentioned because an erroneous date is given by Messrs. Planchon and Lichtenstein.

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1872, an abstract of which, communicated by the author, appears in the 'Annals of Natural History' for July, 1872.

We are also indebted to M. Marey for a remarkable memoir upon the flight of insects and birds treated mechanically, published in the 'Annales des Sciences Naturelles,' vol. xv.

A remarkable memoir, by M. Jobert, on the anatomical structure of the organs of touch throughout the animal kingdom, has appeared in the 'Annales des Sciences Naturelles,' tom. xvi., in which various species of Diptera, Orthoptera and Hymenoptera have been investigated with wonderful delicacy.

The minute anatomy of the respiratory organs of the Araneæ have been investigated by Dr. P. Bertkau, of Cologne, in the 'Archiv. f. Naturgesch,' vol. xxxviii. pt. 2. From the structure of the trachea and spiracles the author establishes five principal divisions in the class of spiders.

An interesting paper on the digestive organization of the mole cricket, by Josef Kolazy, appears in the Zool. & Bot. Ver., Vienna, 1871.

A memoir containing descriptions and figures of the minute structure of the stridulating organs of the Acridiidæ, by Dr. Graber, of the University of Graz, appears in the Zool. & Bot. Ver., Vienna, 1871.

The structure of the apparatus by which the chirping of the grasshoppers with long antennæ is effected, forms the subject of an elaborate illustrated memoir by the last-named author, with the title 'Ueber den Tonapparat der Locustiden, ein Beitrag zum Darwinismus' (Siebold & Kolliker, Zeitschr. f. Wissensch. Zoologie, vol. xxii. p. 100, and pl. ix.). The same subject had also been carefully described by Landois in the seventeenth volume of the same Zeitschrift, especially as observed in Locusta viridissima and Decticus verrucivorus.

Dr. H. Landois has also published a series of observations and figures of the musical apparatus of the Cicadæ, regarded as the analogues of those of the crickets, especially Gryllotalpa vulgaris, in the Zeitschr. f. Wissensch. Zool., 1872, p. 349, pl. 28.

The production of sound by the Death's Head Moth has often attracted attention, and a number of theories have been proposed for its explanation. We are indebted to Mr. H. N. Moseley for a careful examination of the subject and a discussion of the various theories, in a paper published in 'Nature' for June 20, 1872, in

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which he has endeavoured to show that the sound is caused by the rushing out of the air from a small cavity within the head near the base of the short tongue, through a small orifice furnished with strong muscles.

Several instances of insect monstrosities have been described during the past year, varying in the extent of their malformation. These have occurred in Acronycta leporina (Bond, in Trans. Ent. Soc. 1872, p. x), in Spilosoma sordida (by Guenée, noticed in ditto, p. xxvi.), in the veins of the wings of various Lepidoptera (by the Rev. R. P. Murray, in ditto, p. xxxiii.), and in the antennæ of Hydroporus (by Lawson, in the Entom. M. Mag. viii. p. 289). A curious observation on the development of dark varieties of Tephrosia crepuscularia has been recorded by Mr. J. T. Llewelyn, in the Entom. Monthly Mag. (vol. viii. p. 272).

A remarkable memoir, with the title 'Ueber Polygamie und anderweitige Geschlechtsverhaltnisse bei Orthopteren,' appears in the Zool. & Bot. Ver., Vienna, 1871. The observations are made upon Gryllus campestris, between a pair of which he observed eight acts of copulation, extending from the 10th May to the 11th June, and Pezotettix pedestris, in which he observed one male in successive copulation with four females.

Several instances have lately been brought to our notice in which two male insects were simultaneously found *in copulâ* with a single female (Dale, in Ent. M. Mag. ix. 46, and Müller, in ditto, ix. 120).

Geographical Distribution of Insects.

The geographical distribution of insects is a subject of very wide extent, and has attracted our attention at several of our meetings during the past year. On this head I may refer concisely to Mr. Bates's remarks on the Carabidæ of Northern Asia (Trans. Ent. Soc. p. viii.), to those of Mr. Smith on the Hymenoptera of Japan (ib., p. xx.), and to those of Mr. Wollaston on the local distribution of species of Coleoptera (in the Ent. M. M., July, 1872, p. 32). I may also here refer to the account of a remarkable flight of Cynthia Cardui given in the last-named work (vol. ix. p. 149). The singular appearance of great numbers of specimens of Vanessa Antiopa during the last season has been alluded to in all our publications, and has caused considerable discussion; whilst, on the other hand, two remarkable instances of the sudden

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disappearance of insects in places where they had previously abounded have been given by Mr. Edward Waterhouse (Ent. M. M. viii. 205) and Mr. Lennon (ibid. 274).

Some curious instances of mimicry have been noticed by Dr. Hagen (see Ent. M. Mag. vol. ix. p. 78), Mr. Meldola (ib. p. 163), and Dr. Jordan (ib. viii. p. 253).

A remarkable paper has been published by Mr. W. F. Kirby, in the 'Proceedings of the Linnean Society,' in which a comparison is made between the geographical distribution of the Diurnal Lepidoptera and birds, the latter as shown by Dr. Sclater's paper on the geographical distribution of the members of the class Aves, in the second volume of the same work. The following is a concise summary of the comparison thus made:—

	Birds.	Butterflies.
Total number of species - - - - -	7500*	7700
1. Palæarctic Region (Europe, North Asia, Persia, Asia Minor and North Africa) -	650	630
2. Æthiopian or Western Palæotropical Region (Central and Southern Africa, Madagascar, &c.) - - - - - - -	1250	733
3. Middle Palæotropical Region (India and Indian Archipelago) - - - - - -	1500	1250
4. Australian or Western Palæotropical Region (Australia) - - - - - - -	1000	725
5. Nearctic Region (North America) - -	660	480
6. Neotropical Region (South America) - -	2250	4200

Another source of much congratulation may be alluded to, although only yet in its infancy: I allude to the establishment of Zoological Stations on the sea coast, suggested by Dr. Anton Dohrn, and now carried out on the shore of Naples. The admirable memoirs of this naturalist on the development of marine animals is an earnest of the good likely to result from such an establishment. Nor must we overlook the establishment of the Marine Aquarium of Brighton, of which I perceive by the 'Athenæum' of Saturday last (January 25, 1873) that Mr. William Saville Kent, of the British Museum, has been appointed Director, in the place of our late friend Mr. J. K. Lord. This appointment is, I think, also an earnest of good work to be done there.

* It is to be observed that Mr. G. R. Gray added considerably to this number of species of birds, enumerating upwards of 11,000 species; the relative numbers of the different regions would, however, be scarcely altered.

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Intimately connected with this subject is the question of deep-sea dredging, to which so much attention has been directed during the last few years; and entomologists cannot but expect a rich harvest of novelties from the researches of the naturalists employed in the exploring vessel (the 'Challenger') which has but lately left our shores for a three-years' scientific cruise, the Articulata being under the charge of Mr. Moseley, one of the most successful of our Oxford students. The East India Government, in the early part of the past year, sent out a vessel for a three-months' voyage with the like object in the Eastern Seas, but I have not yet heard with what results.

NOMENCLATURE.

The unfruitful subject of Nomenclature has formed the material of several of our evening discussions, and has occupied the attention of several writers in the 'Entomologist's Monthly Magazine.'* Mr. W. A. Lewis† has especially done good service by exposing the endless evils which are being produced in our Systematic Catalogues by the rejection of long-established and universally adopted names in favour of previous but long-neglected or entirely overlooked ones. The legal maxim, "Communis error facit jus," has been happily advanced by Mr. Lewis against such absolute applications of the law of priority, and I have not hesitated, in an article on the subject published in the 'Academy,'‡ to insist that the legal principle, of twenty years' possession of an estate, forming a bar to all previous claimants, might with equal propriety be adopted in zoological nomenclature. I fear, however, that the intemperate style of Mr. Lewis's writings will have the effect of alienating many of those persons who would not hesitate to adopt the principle of ignoring such long-forgotten names which may have been or shall be brought forward with the view of superseding those in universal employment (see Trans. Ent. Soc. 1872, p. xxix.), especially as Mr. Lewis has rashly thought proper to attack, in what appears to me to be an unfounded manner, one of the ablest, as he is at the same time one of the most conscientious of living entomologists, and one who this Society has

* Proc. Ent. Soc. 1872, p. xxix., xxxiv. Entom. Mo. Mag., vol. viii., 253, 254, 276, 291.

† 'A Discussion on the Law of Priority in Entomological Nomenclature,' &c. London, 8vo, 1872.

‡ No. 47, May 1, 1872, No. 169.

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done honour to itself by electing as one of its eight Honorary Members.

Descriptive Entomology.

The technical descriptive literature of our Science continues to increase with wonderful rapidity, threatening to equal in extent that of all the other branches of Zoology combined. It cannot be expected that in an Address of this kind a notice should be attempted of more than the most important, or of the least known, productions of entomological writers during the past year, and hence I have purposely omitted to mention the many excellent memoirs published in the various journals expressly devoted to our Science, such as the 'Transactions' of the various Entomological Societies, and those periodical works which are also more especially confined to Entomology, such as the 'Entomologist's Monthly Magazine,' the 'Entomologist,' the 'Petites Nouvelles Entomologiques,' &c.

In this department of the Science England well holds her own in the race, and the various memoirs of Mr. H. W. Bates on the Cicindelidæ and Carabidæ, as well as those on the Longicorn beetles of Nicaragua and Tropical America; those by Mr. F. Bates on the Heteromerous Coleoptera; Mr. Pascoe's articles on the Curculionidæ of Australia; those of Mr. E. Saunders on the Buprestidæ; the very remarkable memoir of Mr. S. S. Saunders on the Strepsiptera; the exquisitely coloured work on Exotic Butterflies by Mr. Hewitson, and that of Mr. Butler on the same beautiful tribes of insects, equally remarkable as a specimen of colour-printing; together with the most elaborate volume on the Trichopterygidæ published by the Rev. A. Matthews; are all and each as honourable to the Science of the country as they are to their individual authors.

We have to regret the non-appearance (which we trust may be but temporary) of the 'Transactions of the American Entomological Society,' which have, however, to a certain extent, been replaced by those of the Entomological Society established in Canada. And we may be allowed to express our sincere sympathy with the French Entomological Society, whose 'Annales' have again been partially destroyed by fire.

It is with much pleasure we notice that the gradual change which has taken place in the studies of the old Universities is

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already bearing good fruit. From Mr. J. Wood-Mason, one of the most promising of our Oxford students, and who is now attached to the Calcutta Museum, we have received the first portion of a memoir on the Indian and Malayan species of crabs belonging to the family Telphusidæ, illustrated by plates equal to anything hitherto published in Europe (Journal Asiat. Soc. of Bengal, vol. xl.).

A new and interesting genus of Decapod Crustacea has also been described by Mr. Wood-Mason (in the 'Proceedings of the Asiatic Society of Bengal,' August, 1872), which was dredged in deep water off the eastern coast of the Andaman Islands, and which is closely allied to the Northern European Nephrops Norvegicus, but, like Calocaris MacAndreæ of Bell, is destitute of the organs of vision.

Descriptions of the crabs found in the fresh waters of Madagascar have appeared from the pen of M. Alphonse Milne-Edwards (Annales Sci. Nat, tom. xv.).

The Decapodous and Stomapodous Crustacea of the sea round Cuba have formed the subject of a memoir by Dr. Von Martens, in the 'Archiv fur Naturgeschichte' for 1872, in which eighty-four species are described.

M. Hesse has continued his series of articles on the rare and new species of Crustacea of the Coasts of France, in the 'Annales des Sciences Naturelles.'

The numerous new species of Crustacea dredged in the Gulf-Stream in the Straits of Florida during the U. S. Government Coast Survey, have been studied by Dr. W. Stimpson, who has published descriptions of a portion of the Decapoda Brachyura in the 'Bulletin of the Museum of Comparative Zoology of Harvard College, Mass.'

The third part of the Illustrated Catalogue of the Museum of Comparative Zoology of Harvard College is devoted to a Monograph of the North-American Astacidæ, by Dr. H. A. Hagen, in which thirty-eight species are described, thirty-two Cambari and six Astaci. The plates containing figures of the perfect animals and of their minute structural characters leave nothing to be desired.

Under the title of "Zoologische Aphorismen," Dr. Semper has published in the 'Zeitschrift f. Wissench. Zoologie' (1872, pl. 22) several excellent observations on various marine animals observed

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by himself in the Philippine Sea, including the interesting Crustaceous genus Leucifer Reynaudi. The same animal, long ago carefully figured by Thompson, in his 'Zoological Researches,' has also more recently been studied by Claus (Zeitsch. f. Wiss. Zool. 1863) and Dohrn (ibid., 1871).

To Dr. Claus we are indebted for a valuable memoir on the very interesting genus Nebalia (published in the 'Zeitschr. f. Wissench. Zoologie,' 1872, p. 323, pl. xxv.), and also an inquiry into the history and different supposed species of the parasitic genus Phromma, generally found in the sac-like bodies of Beroë and Pyrosoma (ibid., p. 331, plates xxvi. and xxvii.)

Mr. Brady has continued his series of contributions to the study of the Entomostraca, by publishing a list of the non-parasitic Copepoda of the North-East Coast of England, with two plates, in the 'Annals of Natural History,' July, 1872.

At the meeting of the Société Helvetique des Sciences Naturelles, held at Fribourg in August last, M. Vogt gave a summary of the results of his researches in the genera Branchipus and Artemia, the most remarkable fact being that amongst the Artemiæ collected during the months of July and August there are no males, and that the females propagate by parthenogenesis (Ann. of Nat. Hist., Nov. 1872).

The genus Limnadia, interesting not only for its large size amongst the bivalve Entomostracous Crustacea, but also for the vast numbers in which it occurs in the fossil state, has now afforded an Australian species, which has been illustrated by Professor Claus, in the 'Zeitschrift f. Wissench. Zool.,' 1872, p. 355, pl. xxix. and xxx.

Directing our attention next to the Arachnida, a "General List of the Spiders of Palestine and Syria, with Descriptions of numerous new Species, and Characters of two new Genera," has been published in the 'Illustrated Proceedings of the Zoological Society of London' (1872, Feb. 20). Exclusive of the Acaridea, Phalangidea, Solpugidea and Scorpionidea, 278 species of true spiders were collected by the author himself on the plains of the Jordan near Elisha's Well. The two new genera are Palæstina and Cithaeron, both belonging to the Agelinidæ, and the already-known species amounted to 127, the new ones being 151 in number. Four excellent plates full of figures illustrate this memoir.

A memoir on the Araneides of French Guiana, by M. Ladislas

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Taczanowski, is published in the 'Horæ Societatis Entomologicæ Rossicæ' (June, 1872).

An important memoir on the Mygalidæ (Theraphosæ), in which the species are distributed into forty-five genera, by Herr Ausserer, appears in the Zool. and Botan. Ver., Vienna, 1871.

The same author has also given descriptions of a number of new spiders (Radspinnen), belonging to the genera Mastigosoma, Peniza, Cyrtaphora, Singa and Zilla, in the same work.

An extensive list of the species of spiders captured in Scotland in the course of the last year has been published by Mr. J. W. H. Traill, in the 'Scottish Naturalist' for the present month.

A paper on the habits of some of the spiders of Madeira, by F. Pollock, Esq., appears in the 'Annals of Natural History,' October, 1872.

Mr. A. G. Butler, the indefatigable Assistant in the British Museum, has now extended his researches to the apterous groups of insects, and has given a monograph of the genus Thelyphonus, in the 'Annals of Natural History,' Sept., 1872.

The same gentleman has also published descriptions of new species of Myriopoda of the family Glomeridæ, in the same 'Annals' for November, 1872.

A very remarkable new genus belonging to the Thelyphonidea has been forwarded by Mr. Thwaites, the distinguished botanist and Superintendent of the Government Botanical Gardens at Peradenia, Ceylon, of which descriptions and figures of two species (Nyctalops crassicaudata and tenuicaudata) have been published by the Rev. O. P. Cambridge, in the 'Annals of Natural History,' Dec., 1872. Not only are the eyes entirely wanting, but the cephalothorax is divided into two segments; the caudal appendages are also quite unlike those of any previous known Arachnid.

The structure of the sucker and the internal anatomy of the crab louse (*Phthirius inguinalis* of Leach) has formed the subject of a detailed memoir by Dr. Von Graber, in Siebold and Kolliker's 'Zeitschrift f. Wissench. Zoologie' (vol. xxii., 1872, pp. 137—167, plate xi.); and of Pediculus capitis and vestimenti, also by Landois, vol. xv., pp. 32—55 and 494—503.

The anatomy of the former animal has also been elaborated in a memoir, in the fourteenth volume of the same work, by M. Landois.

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It is gratifying to find that Entomology is making way steadily at the Antipodes. In addition to the 'Transactions of the Entomological Society of New South Wales,' of which two volumes are completed, each in four parts, Mr. George Masters has published, at Sydney, three parts of a 'Catalogue of the described Coleoptera of Australia,' 8vo, pp. 192, 1871 and 1872. Each part price 3*s.* 6*d.* The same writer has also published 'A List of the Australian Longicornes, chiefly described and arranged by Francis P. Pascoe, Esq., with additional localities and corrections," by the author.

Descriptions of new species of Coleoptera from Oran, by Herr Reitter, have appeared in the 'Berliner Entom. Zeitsch.'

The Curculionidæ collected by Dr. Gundlach in the Island of Cuba have been described by Dr. Suffrian, in the 'Archiv. für Naturgeschichte.'

Mr. Pascoe has given us, in the 'Annals of Natural History,' another series of descriptions of new and interesting Exotic Coleoptera, for the most part belonging to the family Brenthidæ.

A memoir on the European Clythridæ, by Dr. Kraatz, appears in the 'Berliner Ent. Zeitschrift.'

A revision of the European species of the genus Malthodes, by Herr von Kiesenwetter, appears in the 'Berliner Entomol. Zeitschrift.'

A revision of the European species of the genus Meligethes, by Herr E. Reitter, has been published as an appendix to the ninth volume of the 'Verhandlungen' of the Natural History Society of Brunn, and a supplement to the same memoir, in which the South African species of the same genus have been described by the same author, appears in the 'Berliner Entom. Zeitschrift.'

The 'Memoirs of the Peabody Academy of Science' opened with an excellent monograph of the large stylated fossorial crickets, forming the genus Gryllotalpa and a new genus separated therefrom to contain the species with only two fingers on the anterior tibiæ (Scapteriscus). Twenty-three species are very carefully described.

M. Henri de Saussure, our newly-elected Honorary Member, has published the fourth fascicule of his 'Mélanges Orthoptérologiques,' in which he has revised the generic arrangement of the families Mantidæ and Blattidæ, and has added the descriptions of a number of new species of both those families.

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The Neuroptera of the northern part of Asia, especially the species inhabiting Amurland, have formed the subject of a joint memoir by Messrs. de Selys-Longchamps and M'Lachlan, published in the fifteenth volume of the 'Annales de la Société Entomologique de Belgique,' 1872. It is a curious fact in the geographical distribution of these insects that of forty-four species of Libellula, *L.*, here described, thirty are met with on the European side of the Ural range of mountains, and as many as twenty-five are absolutely natives of Belgium; and thirty-one species of the other Neuropterous groups found in Britain occur also in Siberia. One new genus (Amphipsyche) among the Phryganeidæ is established by Mr. M'Lachlan.

A memoir on the Neuroptera Planipennia of Scandinavia was published at the close of 1871, by Pastor Wallengren, in the 'Transactions of the Swedish Academy,' in which he describes fifty Swedish species, being the precise number enumerated in the 'Catalogue of British Neuroptera,' by Mr. M'Lachlan.

Several memoirs on Scottish Tenthredinidæ, by Mr. P. Cameron, have appeared in the 'Scottish Naturalist.'

The Tenthredinidæ and Siricidæ of Scandinavia have been reinvestigated by C. G. Thomson, in a work published in 1871 at Lund ('Hymenoptera Scandinaviæ,' 8vo, pp. 1—342). It is singular that the larvæ of these insects, which Herr Thomson's countryman, Prof. Dahlbom, of Lund, had especially investigated and described, should be ignored in this new work.

Our indefatigable friend, Mr. S. C. Snellen Van Vollenhoven, the Director of the Entomological portion of the Royal Museum at Leyden, has published the third part of his excellent 'Schetsen ten Gebruike bij de Studie der Hymenoptera,' oblong folio, containing illustrations of ninety-six genera of Chalcididæ. The very cheap price at which this work is issued by the Entomological Society of the Netherlands ought to ensure a large sale.

Under the modest title 'Ichneumonologische Fragmente,' Herr Tschek has described a considerable number of new Austrian species of various genera of Ichneumonidæ, including eleven Sigaritis and eleven Casinaria (Vienna Zool. Bot. Ver., 1871).

A memoir by Professor Achille Costa, on the Aculeated Fossorial Hymenoptera of Italy, with figures, appears in the Annuario del Museo Zoologico, anno vi.

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An extended Monograph of the Andrenideous Genus Hylæus, with descriptions of 107 species, by Prof. Förster, of Aix-la-Chapelle, is published in the 'Zool. & Bot. Ver.,' Vienna, 1871.

Dr. Morawitz has published a memoir on the Apidæ of Southern Russia, in the June part of the 'Horæ Societatis Entomol. Rossicæ.'

Dr. Dours, of Amiens, has also published the descriptions of various new Hymenoptera, chiefly Apidæ, in the 'Revue d. Zoologie' for 1872.

Under the title of "A Systematic Revision of some of the American Butterflies, with brief Notes of those known to occur in Essex County, Mass.," published in the 'Report of the Peabody Academy of Science,' and separately, "Salem, Mass., 1872," Mr. Samuel H. Scudder has given us the result of a critical examination of the structural features of many American butterflies, principally of those of New England, and which is greatly at variance with the views of his predecessors in the classification, description and nomenclature of the genera of Diurnal Lepidoptera, of whom he speaks rather disparagingly. This result appears in the proposal of not fewer than ninety-six genera for those North American species which he has examined, of which nearly half belonged to the Hesperidæ, and which are simply named and "uncharacterized." He has, however, given us the characters of two of his genera in detail, "as a means of telling, to a certain extent, the value of the subdivisions of the whole paper. In my forthcoming work on New England butterflies, all the genera will be thus treated, and additional characters will be drawn from the genitalia and from the egg." The two genera thus selected are "Papilio, *Linn.* (1758). Type Papilio Antiopa, *Linn.*" !! and "Aglais, *Dalm.* (1816). Type Papilio Urticæ, *Linn.*" The characters of each of these two genera extend over five closely printed 8vo pages. Mr. Scudder in thus using the generic name Papilio, "conflicting with, so far as I know, the *unanimous* usage of subsequent authorities," admits that his chief reason is that it may hasten the disintegration of the genus Papilio of modern authors. As a writer on the "Genera of Diurnal Lepidoptera," I do not hesitate to say that this excessive elaboration of generic characters must necessarily involve, on the one hand, a large amount of family or even sectional structure (and consequently must be repeated over and over again), and on the other a still

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greater amount of the *specific* characters of the insect selected as the generic type.

Descriptions of some new species of Charaxes and Cyligramma rom Madagascar, by M. Lucas, have appeared in the 'Annales des Sciences Naturelles,' t. xv.

Descriptions and figures of various new species of Morpho have been published by M. Deyrolle, in the 'Revue de Zoologie,' with plates.

The indefatigable Lepidopterist, Mr. W. F. Kirby, has read a memoir, on the ocellated silkworm moths of the family Saturnidæ, before the Royal Dublin Society, on the 18th March, 1872, in which thirty-six species are enumerated, and notes added on the economy of some of the species.

Mr. F. Moore, whose attention has long been specially directed to the Lepidoptera of the East, has given us an extended memoir containing descriptions and figures of a number of new Indian species, both of butterflies and moths, in the 'Illustrated Proceedings of the Zoological Society of London,' 16th April, 1872.

A description and figure of a curious Nocturnal Lepidopterous insect was published by Mr. Butler, in the 'Annals of Natural History,' under the name of Tarsolepis remicauda, which has given rise to an angry discussion between himself and M. Ritsema, who has considered it as identical with the Crinodes Sommeri of Hübner.

The water bugs of the subfamily Belostomides, divided into eleven genera, by Dr. Gustav Mayr, appears in the 'Zool. & Botan. Ver.,' Vienna, 1871.

Further portions of M. Signoret's elaborate memoir on the Coccidæ have appeared in the French 'Annales.'

The descriptions of a tenth century of the Diptera of North America, by Dr. Loew, has appeared in the 'Berliner Entomologische Zeitschrift,' during the past year.

Descriptions of fourteen new species of the Dipterous Genus Sciara by Winnertz, are published in the 'Vienna Zool. & Bot. Ver.,' 1871.

A very interesting little fresh-water animal has recently been described and figured by Dr. C. T. Hudson, LL.D., under the name of Pedalion mora, belonging to the Rotifera, and yet possessing several peculiarities which seem to connect that curious

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group of minute creatures with the Articulata, giving to the whole class "a high place in the natural system" near the Articulata rather than the Annelida. The limbs of this remarkable new animal are worked by muscles and have obvious joints, and hence Sir John Lubbock observes that "some of the Rotatoria, such as the very remarkable Pedalion, seem to lead through the Nauplius form to the Crustacea." A short but instructive note on the animal, by Mr. E. Ray Lankester, is given as an appendix to Dr. Hudson's article. ('Quarterly Journal of Microscopical Science,' October, 1872, plate 19.)

Mr. Dunning proposed, and Mr. Weir seconded, a vote of thanks to the officers for the past year; this was carried unanimously, and Prof. Westwood and Mr. Stevens returned thanks.

Mr. Pascoe proposed, and Mr. Stainton seconded, a vote of thanks to Mr. Dunning for his donation of £50 to the Society's funds; this also was carried unanimously.

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Abstract of the Treasurer's Accounts for 1872.

Receipts.	£	s.	d.	Payments.	£	s.	d.
By Balance in hand, 1st Jan., 1872	3	1	8	To Rent, Librarian, and Office Expenses	55	10	5
„ Arrears of Subscriptions	15	15	0	„ Printing	165	11	0
„ Subscriptions for 1872	143	17	0	„ Plates, engraving, printing and colouring	42	11	11
„ Admission Fees	14	14	0	„ Books purchased, & binding	11	11	3
„ Composition	15	15	0	„ Cost of £17 0*s.* 4*d.* Consols purchased	15	15	0
„ Sale of Publications	58	3	2	„ Tea, 13 Meetings	13	13	0
„ Interest on £164 18*s.* 1*d.* Consols	4	18	10	Balance in Treasurer's hands	15	6	1
„ Tea Subscriptions	8	14	0				
„ Donation from J. W. Dunning, Esq.	50	0	0				
„ „ „ W. Wilson Saunders, Esq.	5	0	0				
	£319	18	8		£319	18	8

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Liabilities.	£	s.	d.	Assets.	£	s.	d.
To Loan of Mr. Dunning	45	0	0	By Arrears of Subscriptions:— Good (say)	23	2	0
				Doubtful £69 0*s.* 0*d.*			
				„ £181 18*s.* 5*d.* Consols (cost)	167	4	0
				„ Cash Balance in hand	15	6	1
	£45	0	0		205	12	1
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					£160	12	1

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The Arabic Figures refer to the pages of the 'Transactions;' the Roman Numerals to the pages of the 'Proceedings.'

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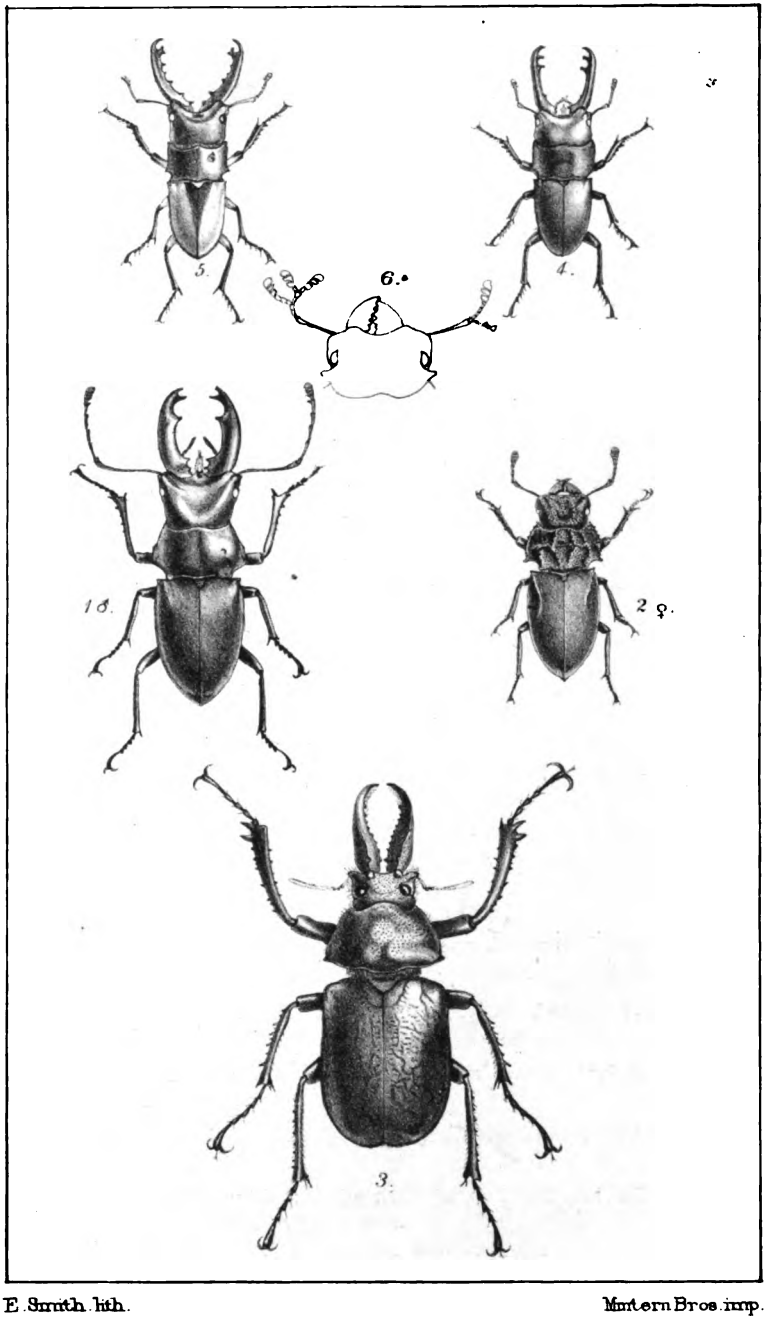

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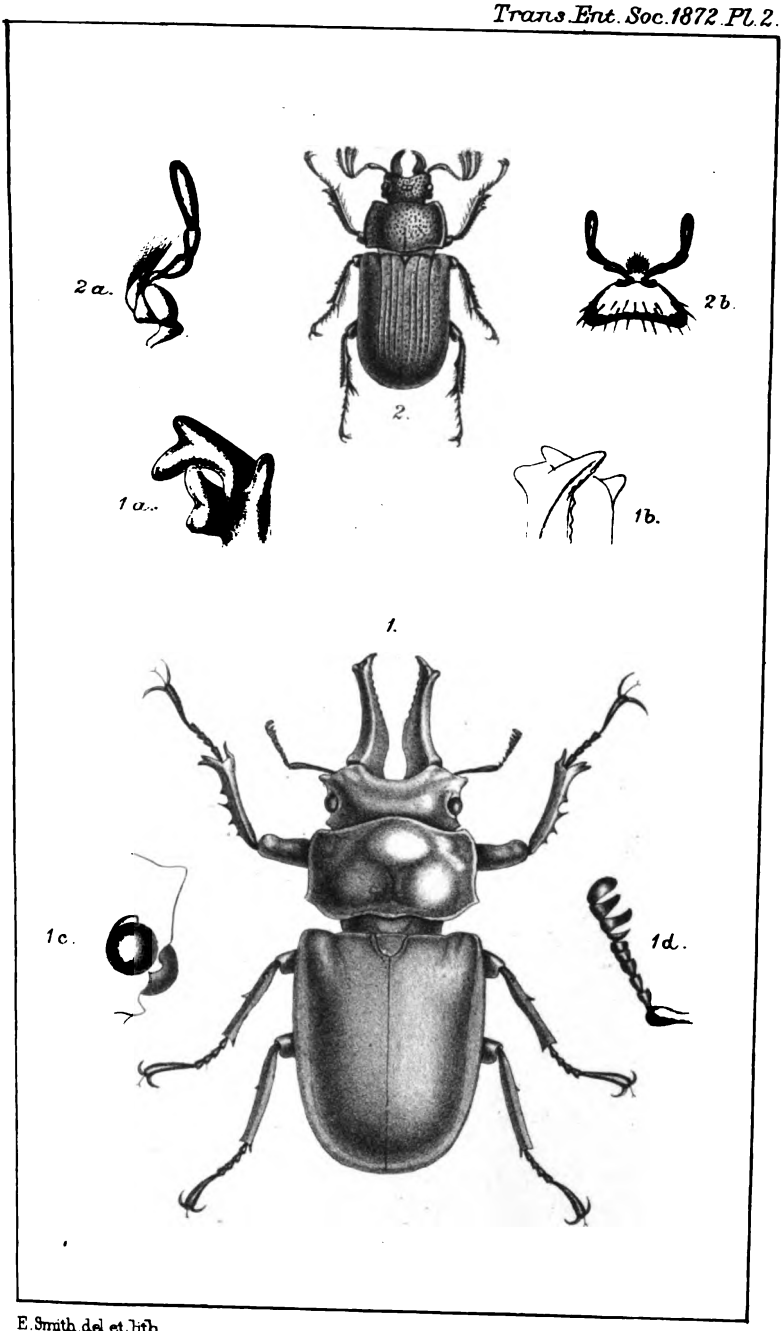

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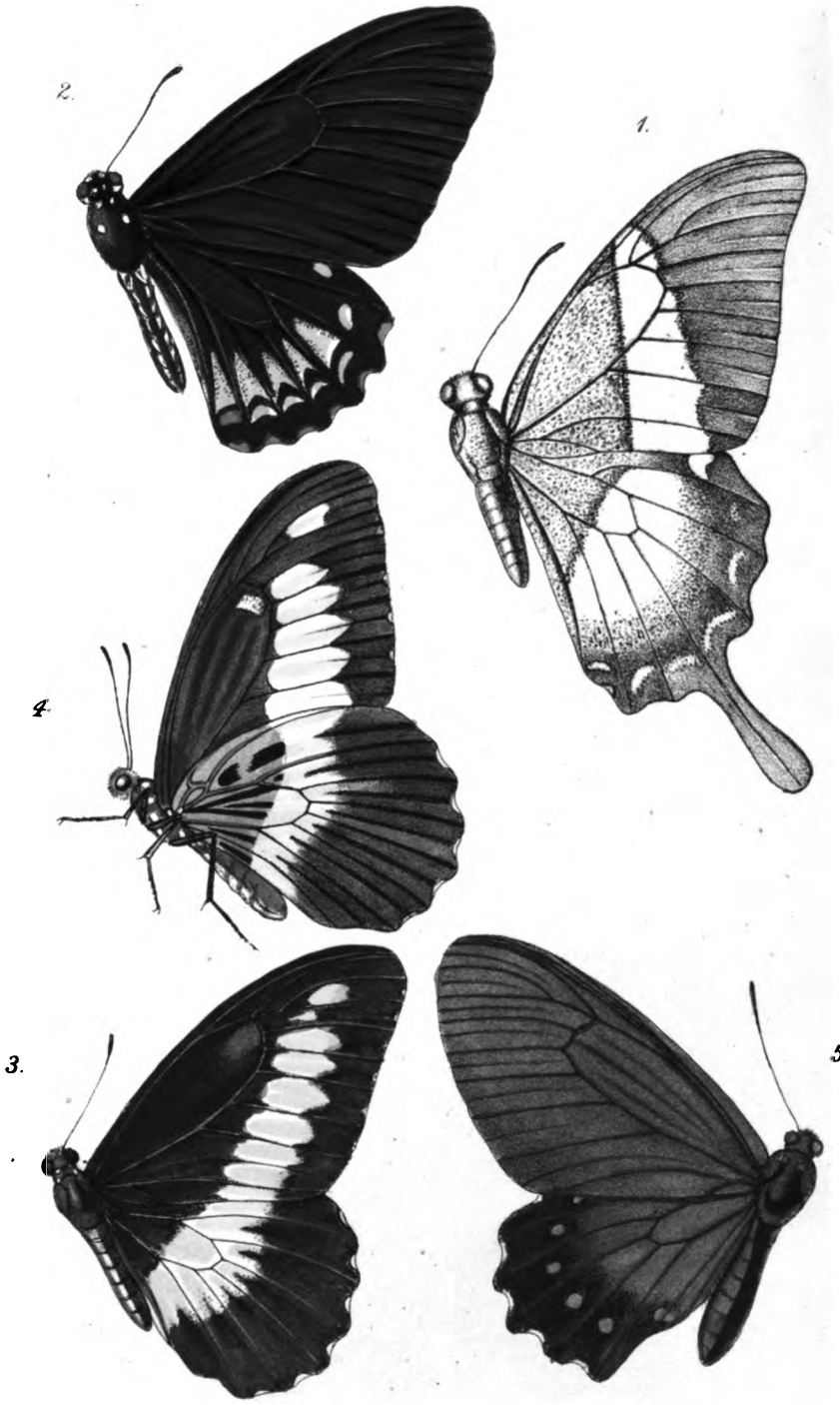

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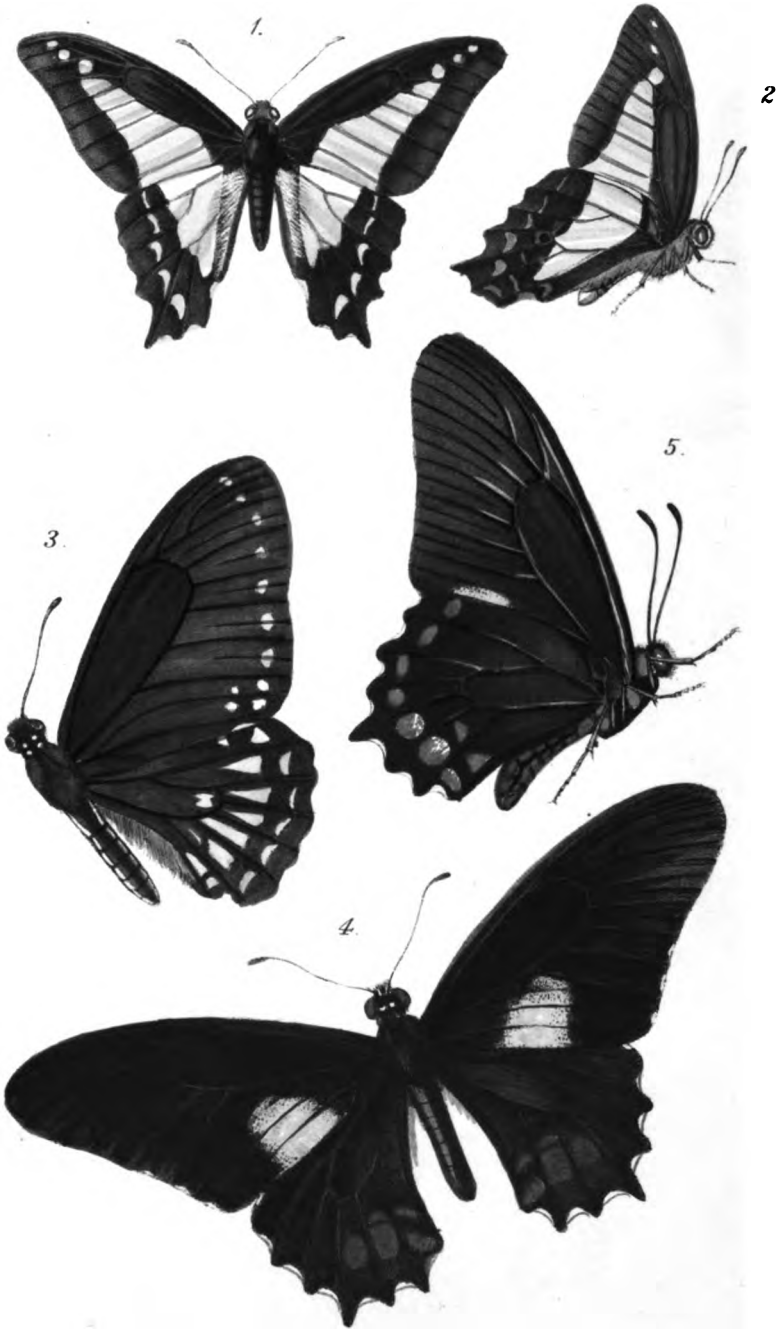

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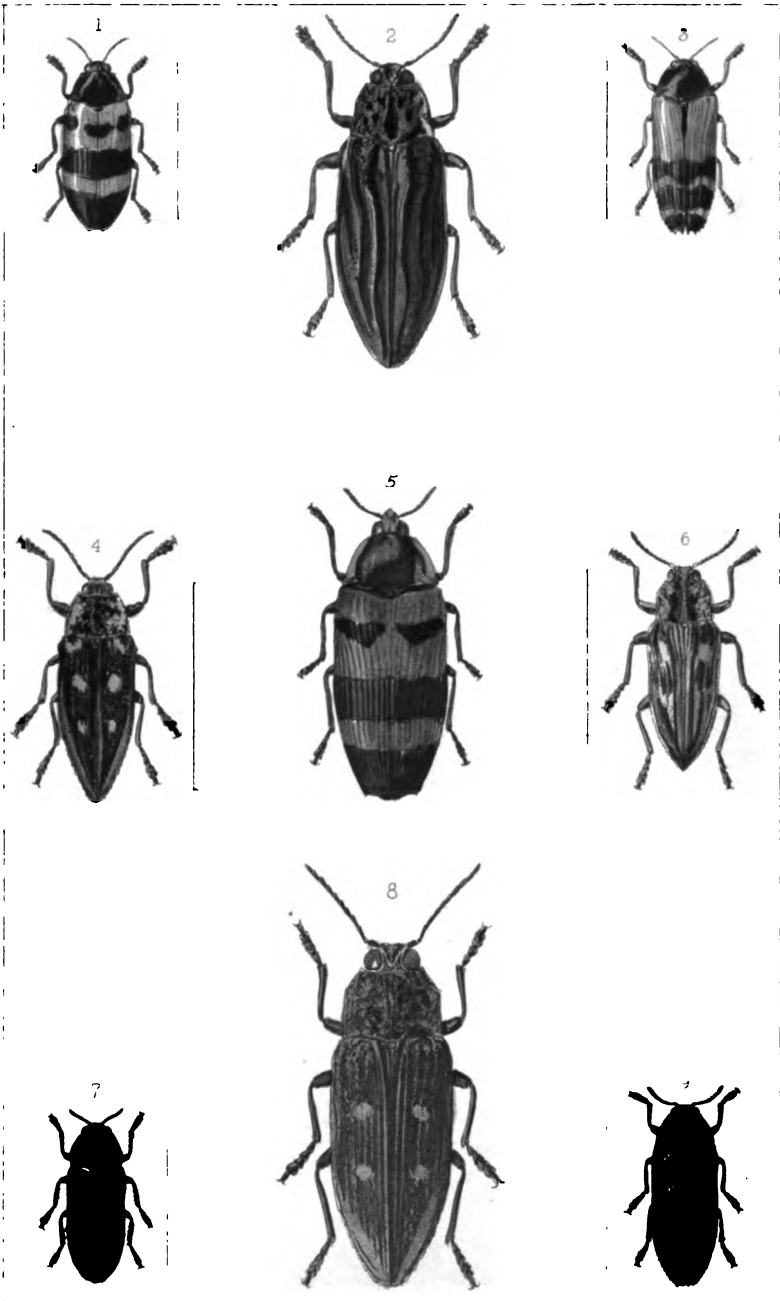

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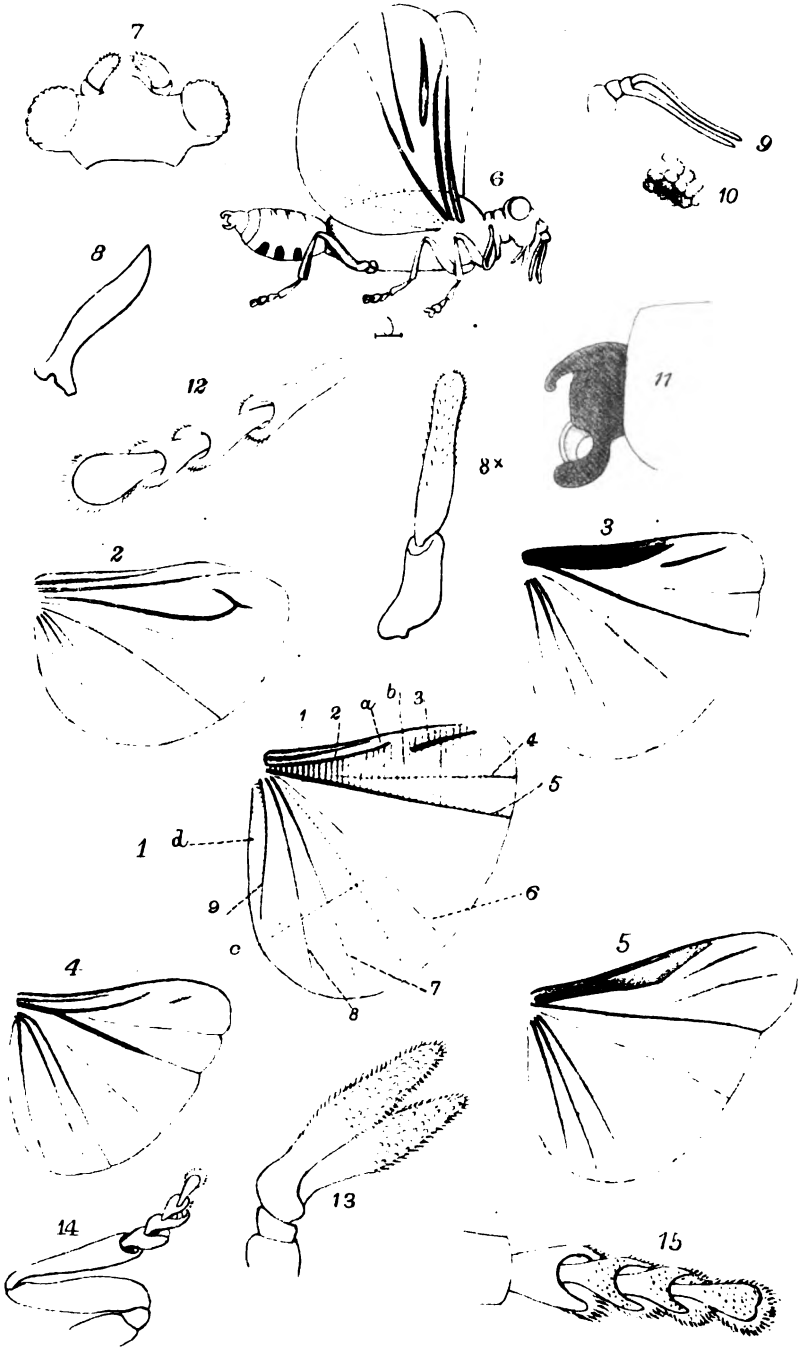

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